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Doctoral Thesis

CLIL Lesson Plan Analysis

Analýza písemně zpracovaných příprav na hodinu CLIL

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I hereby declare that I am the sole author of the doctoral thesis CLIL Lesson Plan Analysis. This dissertation was compiled under the supervision of prof. RNDr. Jarmila Novotná, CSc., using the resources listed in the thesis. It has not been previously submitted for a doctoral or other degree at this or any other university.

Prague, 1. 10. 2018 Lenka Procházková

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To my family who supported me throughout the process: You have been given innumerable promises for the time "when Mum finishes the book"; thank you for giving me the chance, and I hereby proclaim 'the book' finished.

Abstrakt

Content and Language Integrated Learning (CLIL) je pedagogický přístup, kdy se cizí jazyk používá jako nástroj pro vyučování nejazykového předmětu, resp. jeho části. Přestože existují nejrůznější podoby implementace CLIL, je možné v publikovaných zdrojích vysledovat společné prvky vyučování a plánování CLIL.

Tento výzkum předkládá obsahovou analýzu 56 písemně zpracovaných příprav na CLIL hodinu finanční matematiky/gramotnosti. Cílem tohoto výzkumu bylo stanovit, jestli tyto přípravy odpovídají publikovaným didaktickým přístupům CLIL, resp. do jaké míry jejich autoři vnímají tyto principy jako prvky plánování hodin CLIL a jak jejich vlastní přípravy jejich teoretická tvrzení odrážejí. Práce sledovala také rozdíly mezi učiteli s aprobací pro cizí jazyk a bez ní.

V rámci dizertační práce byl vytvořen původní nástroj pro analýzu příprav na hodinu v kontextu CLIL (LPAT), který byl využit jednak jako podklad pro kvantitativní dotazník, jednak jako rámec pro obsahovou analýzu písemně zpracovaných příprav na hodinu. V rámci tohoto nástroje bylo identifikováno osm klíčových didaktických prvků CLIL pozorovatelných v písemně zpracovaných přípravách.

Ve zkoumaném vzorku učitelé kombinovali klíčové prvky s dalšími položkami LPAT jak v dotazníku, tak v samotných přípravách. Můžeme tak shrnout, že prvky, které byly v našem vzorku chápany jako zásadní v písemně zpracované přípravě na hodinu CLIL, se neshodují s těmi, které jsou formulované v literatuře.

V celkovém náhledu nebyly rozdíly mezi prvky LPAT, které zařazují do příprav učitelé cizích jazyků a učitelé nejazykových předmětů; jejich přípravy se nicméně lišily v tom, jak každá ze skupin klíčové prvky naplňuje.

Klíčová slova

CLIL, finanční gramotnost, obsahová analýza, příprava na hodinu, vzdělávání

Abstract

Content and language integrated learning (CLIL) is a dual focused educational approach in which an additional language is used for the learning and teaching of both language and a non-linguistic subject or its part. While there are numerous forms of CLIL implementation, it is possible to define universal pedagogical principles for CLIL teaching and planning.

This research presents a content analysis of 56 lesson plans for a CLIL lesson of financial mathematics/literacy. The aim of this research was to establish whether these lesson plans reflected the CLIL pedagogical principles, to establish what features the respondents saw as key features to a CLIL lesson plan, and whether/how the lesson plans corresponded to the respondents' theoretical proclamations. Our research investigated also the differences in lesson plans by these two sub-groups.

An original lesson plan analysis tool (LPAT) was created for this research. It was used as a basis for a quantitative survey and as a framework in content analysis of the lesson plans. The tool identified eight key features of a CLIL lesson plan.

The respondent combined approximately five of the key features with other features of the LPAT both in the survey and in the lesson plans. Both the survey and the analysis show that the respondents did not identify the same key features of a CLIL lesson plan as the CLIL publications.

On the level of individual LPAT items, there were no significant differences between the L2 teachers and the non-L2 ones; however, the two groups differed in types of manifestations of the features.

Key words

CLIL, financial literacy, content analysis, lesson plan, education

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Introduction

Content and Language Integrated Learning (CLIL) is a "dual focused educational approach in which an additional language is used for the learning and teaching of both content and language" (Coyle, Hood & Marsh, 2010, p. 1). It is being increasingly adopted at schools throughout Europe, Latin America and Asia. Nevertheless, there are so many models and approaches to CLIL that it is becoming difficult to establish what CLIL really is.

It is not the intention of this work to discuss the benefits or pitfalls of CLIL implementation for the learners or the effectivity of the approach as such; instead, CLIL-labelled pedagogical endeavours are acknowledged as an existing practice of increasing extent within the Czech Educational system.

CLIL at Czech schools is present both as a grassroots activity of enthusiasts and as a top-down trend. Czech teachers may find themselves in a situation where CLIL is basically imposed on them by the principal. Besides, there is a blatant dearth of CLIL materials that would fit a particular setting. In the end, teachers create their CLIL daily lesson plans from scratch or they adapt them from resources available to them. Our intent was to find out to which extent these lesson plans (and their authors) are actually CLIL as presented in literature, and/or what features do such lesson plans (and their authors) typically include. Furthermore, as CLIL is taught either by language teachers or by content subject teachers, we wanted to investigate the differences in lesson planning between these two groups.

We focus on CLIL in the context of teaching financial literacy/financial mathematics in the Czech context. Financial literacy is becoming one the key competences for the modern world, and the educational system is reflecting that. The Czech Ministry of Finance, following OECD and EU recommendations, created a National strategy of financial education (Ministerstvo financí, 2010), and standards of financial literacy have been created and revised (Ministerstvo financí, 2010, 2017).

The general aims of this thesis are

- **to identify the key characteristics of a CLIL lesson plan,**
- **to analyse the manifestations of teachers' understanding of CLIL in their lesson plans,**
- **to ascertain whether these manifestations depended on teacher qualification,**
- **to establish whether the lesson plans comply with CLIL principles.**

Throughout the thesis, the educational levels are identified in concordance with the ISCED terminology: primary schools: learners of age 6-12; lower secondary school: age of learners 12-15, and higher secondary school: age 15-18. In agreement with the Czech legislative, we use the term "compulsory education" to cover the primary and lower secondary levels. Young people attending primary or secondary school of any kind will be consistently referred to as "learners", while the term "students" will be invariably referring to tertiary education students.

The code L1 is used in the thesis to refer to mother tongue and the standard language of instruction; L2 is used for a second/additional/foreign language, typically the language of CLIL instruction. In most cases, the L2 is English, however, we keep to the L1-L2 distinction.

All translation from languages other than English were made by the author (unless stated otherwise). Examples from authentic lesson plans featuring a Czech text are translated in footnotes.

1 Theoretical framework

In this chapter, a variety of perspectives that academics and practitioners adopt on CLIL is presented, and the implications that this diversity has on CLIL research are discussed. Principles of CLIL teaching are outlined, dedicating a special section to scaffolding and to the language of mathematics. The chapter is concluded by particularizing the understanding of CLIL that will be employed throughout this thesis.

1.1 The many faces of CLIL

Eurydice report (2005) holds that CLIL "seeks to develop proficiency in both the non-language subject and the language in which this is taught, attaching the same importance to each." The current trend, however, is to describe CLIL as a continuum of practices; the terms "soft CLIL" or "weak CLIL" are being used for language-driven provision where the primary objective is language development, and terms "hard CLIL" or "strong CLIL" for contexts where the content is the driving aspect (Ball, 2009; Bentley, 2010, Esteban 2015, Llinares, Morton, & Whittaker, 2012). Šmídová, Tejkalová & Vojtková (2012) ponder the hard-soft CLIL continuum within content classes only and hold that the extent of classes taught through L2 is the distinctive feature of hard/soft CLIL. Ioannou-Georgiou & Pavlou (2011, p. 16) illustrate the content-language scale of the CLIL continuum through specific provisions of CLIL (see Figure 1: CLIL continuum (Ioannou-Georgiou & Pavlou, 2011, p.16)).

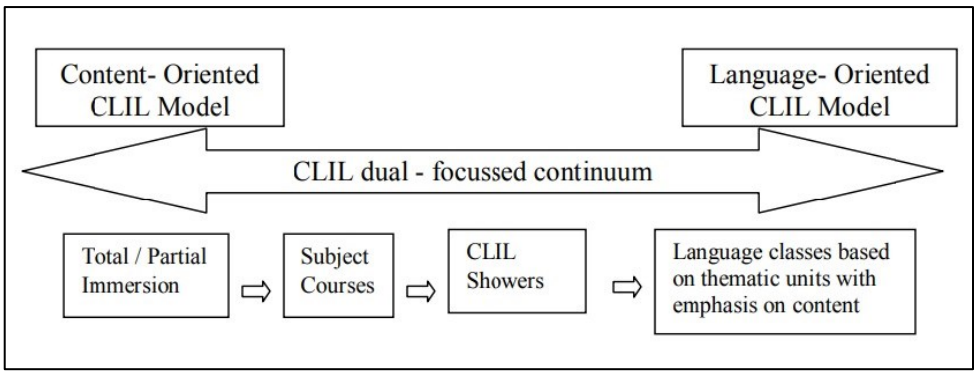


Figure 1: CLIL continuum (Ioannou-Georgiou & Pavlou, 2011, p.16)

In the Czech Republic, the Ministry of Education approaches this continuum from a slightly different perspective, describing the three most frequent models of CLIL as follows: "1/ L2 teaching focuses on vocabulary of the content subject(s). 2/ Learners

work with L2 materials in a content subject and answer in L1. Teacher uses L2 for instructions and uses L1 to explain linguistic aspects of L2. 3/ Learners learn in L2, instructions are in L2, learners may reply in both languages, teacher may employ both L1 and L2 to explain linguistic features." (Výzkumný ústav pedagogický, 2008). The ministerial document even explicitly claims that "the 'climax' of CLIL would be a whole subject taught through L2 – in other words, an immersive model" (ibid.).

In addition to the existence of the "language-content continuum", CLIL encompasses a wide scale of variables, from differing educational systems or the cultural-linguistic contexts of different European countries to aspects such as the age of the learners, selectivity of the programmes, etc. Coyle et al. (2010) identify two key factors that determine the specifics of CLIL implementation: operating factors (e.g. teacher availability, time available, CLIL-language fluency, networking…), and scale (extensive/partial instruction through L2). Ball, Kelly and Clegg (2015, p. 1) outline the characteristics of European CLIL, distinguishing it from other pedagogical endeavours that combine language and content to a certain extent: it "tends to be offered mainly to students who speak the majority language, (...) it is normally restricted to one or two subjects in any school curriculum, and it is self-selecting: schools opt to offer it."

There appears to be no consensus about what CLIL actually is. Some authors (cf. Wright & Boun 2015) carefully avoid any labelling using the acronym as a standalone notion. In the Czech context, CLIL is often referred to as a "method" (NIDV 2011, Binterová & Komínková, 2013, Šulistová 2013, Puškáš 2017, Vallin 2017). Many authors present CLIL as an educational or pedagogical approach (e.g. Dalton-Puffer, 2011, p. 9; Graddol, 2006, Mehisto, Marsh & Frigols, 2008, p. 36; Ruiz de Zarobe, Sierra, & Gallardo del Puerto 2011, p. 13, Meyer 2010, p. 12); Helbig (2003, p. 179) calls it an "unterrichtsmethodisches Prinzip" (principle of a teaching method). DeGraaf, Koopman & Westhoff (2007) state that "CLIL is becoming a popular and widespread *practice of immersion education*". Coyle (2011) and Wiesemes (2009) place CLIL within Kumaravadivelu's postmethod pedagogies (cf. Kumaravadivelu 2001, 2006). Ball et al. (2015, p. 1) provide perhaps the briefest definition, saying that CLIL is a "*way of teaching and learning* subjects in a second language".

There are tendencies to define CLIL by comparing it to bilingual education and identifying the differences (cf. Lasagabaster & Sierra 2009, Ball et al. 2013). Notwithstanding, other authors seem to use the terms interchangeably (cf. Vázquez 2007, Moore 2011, Sepešiová 2015). Even in the relatively small and homogeneous educational context of the Czech Republic, there are significant discrepancies in the perception of CLIL: Nezval (2009) holds that "CLIL is often misinterpreted as teaching a non-linguistic subject in a foreign language or as teaching a language based on non-linguistic content and inter-subject connections." However, a nation-wide research on CLIL implementation (carried out 2008-2011) used the expression "using foreign language in teaching content subjects and using content curriculum in teaching languages" as a synonym for "implementing CLIL" (Kubů, Matoušková & Mužík, 2011).

All in all, even if the aims of CLIL are by all means dual, most provisions appear to give priority to one of them. Marsh & Frigols (2012) claim that CLIL is "more often within the domain of subject teaching, rather than language teaching." Hüttner & Smit (2014, p. 161) ascertain that "CLIL lessons (...) are taught by content specialist (...) but generally not by language specialists". On the contrary, European Commission (1995, 2005, 2014) and an abundance of authors (e.g. Pokrivčáková, 2015, or Banegas, 2014, 2015) focus on the role of CLIL in language education.

We agree with Ricci Garotti (2007 as cited in Infante, Benvenuto & Lastrucci, 2008, p. 157) who holds that "it is not the label CLIL that guarantees quality in projects, instead a pivotal role for their success is played by methodology and teaching". In the following sections, we present the existing theoretical frameworks for CLIL and introduce the methods and principles that effective CLIL programmes employ, and CLIL teaching programmes aim for. We intend to illustrate that there is significant concordance in CLIL didactic principles.

1.2 Research of CLIL

It is not the intention of this work to discuss the benefits or pitfalls of CLIL for the learners; instead, it acknowledges CLIL as an existing practice within the Czech Educational system (see Kubů, 2012, Vallin, 2017, Hanušová & Vojtková, 2011, Šmídová, Tejkalová & Vojtková, 2012, Šimonová, 2015 for details on CLIL

implementation in the Czech Republic, and Banát, 2016 for an overview of Czech theses on CLIL). In this section, we want to place our research on the CLIL research maps detailed by CLIL theorists (or explain why our research does not fit the published research frameworks), and also relate it to pertinent studies outside the CLIL realm.

There are numerous authors that present an overview of CLIL research (cf. Coyle (2008a, 2013), Dalton-Puffer & Smit (2007), Dalton-Puffer (2008, 2009), Ruiz de Zarobe and Jiménez Catalán (2009), Bruton (2011, 2013), Bonnet (2012), Pérez Cañado (2012, 2014, 2017), Hüttner and Smit (2013), Cenoz, Genesee & Gorter (2014), some of them lately engaging in an academic polemic about the quality, relevance, validity, significance and applicability of CLIL research and CLIL as such. Pérez Cañado (2017) labels this polemic a "pendulum effect", observing a shift from an initial (almost uncritically) optimistic attitude and a bias towards the benefits of CLIL, to a more sceptical or even pessimistic perception of the possibilities of the approach. She also identifies and classifies the shortcomings of many CLIL studies in terms of variables (especially the homogeneity of the samples, and weighing in of moderating variables), research design, and statistical methodology.

Even apart from the possible deficiencies in the studies and the potential bias, a reader of CLIL research needs to pay meticulous attention to detail due to the unfathomable heterogeneity that CLIL encompasses. Coyle (2008b) documents 216 different programmes under the headline of CLIL, varying in the linguistic context, intensity, content subject(s), curricular contexts, age of students, their L2 level, duration of the programme etc. This plethora of variables can present a significant hindrance to research results transferability and generalizability.

Furthermore, Marsh (in Ruiz de Zarobe & Jiménez Catalán, 2009, p. vii) claims that "CLIL practice has often preceded research," and Tudor (2008, p. 55) also points to this paucity of research: "The significant expansion of CLIL (…) in recent years has not been supported by a comparable level of research." Several authors try to bridge this gap and systemize CLIL research.

Van de Craen et al. (2007, p. 71-74) present the following six tenets or principled approaches towards CLIL research:

Tenet 1. Target or second language development. Main research question: does the CLIL approach lead to better language proficiency in the target language compared to traditional approaches?

Tenet 2. First language or mother tongue development. Main research question: does CLIL lead to improved first language development compared to traditional approaches?

Tenet 3. Subject matter knowledge. Main research question: does CLIL lead to better subject matter knowledge than traditional learning?

Tenet 4. Attitudes and motivation. Main research question: in what way does CLIL influence attitudes and motivation vis-à-vis languages and language learning?

Tenet 5. Cognitive aspects. Main research question: in what way does CLIL influence cognitive development as compared to traditional (language) learning?

Tenet 6. Brain matters. Main research question: how does CLIL affect brain development as compared to traditional (foreign) language learning approaches?

Van de Craen seems to be focusing purely on CLIL effects on learning. Since the focal point of our research are the teachers, their beliefs and their work as lesson designers, this framework fails to provide for us.

Wolff publishes five CLIL research perspectives

1. Research on the acquisition of linguistic competence in a CLIL classroom.
2. Research on the acquisition of content subject competence in a CLIL classroom.
3. Research on the acquisition of intercultural competence in a CLIL classroom.
4. Research focusing on content subject methodology in a CLIL context.
5. Research on the evaluation of CLIL by teachers and learners. (Wolff, 2005, p. 21)

Our research is not straightforwardly attributable to any of Wolff's categories – we do not aim strictly at content subject methodology, since our participants represent different poles of the CLIL continuum, some being L2 teachers and others content subject teachers.

Dalton-Puffer (2005) illustrates the dimensions along which CLIL research had been carried out, noting that most research focused on the "micro" level of individual provisions, with slightly more attention paid to processes than to products (see Figure 2).

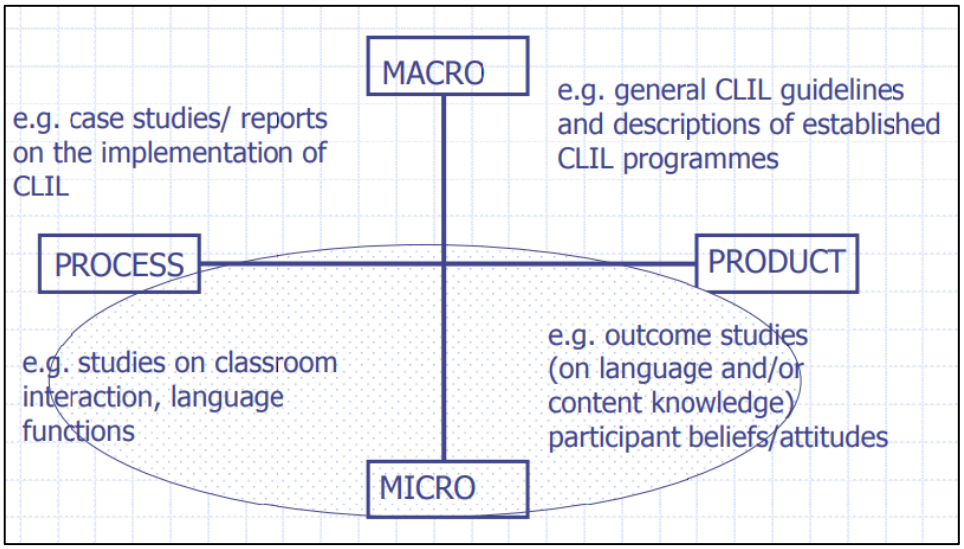


Figure 2: CLIL research perspectives (Dalton-Puffer, 2014, p. 8)

Using Dalton-Puffer's grid, we would place our research among the product-oriented studies, since we map lesson plans (products by CLIL teachers) and teachers' beliefs, and on a centric position on the micro-macro scale, since the participants of our study engage in different CLIL endeavours but are hardly a representative sample of say Czech CLIL.

Šimonová (2015, p. 67-74) identifies six areas of CLIL research:

- learner-based (learners' psycholinguistic characteristics and learning outcomes in general);
- teacher-based (specific professional characteristics and teaching competences of CLIL teachers);
- language-based (L1/L2 use and combining, and the outcomes of such combinations, e.g. code-switching);
- content-based (how the content of education is coded in L2 and how learners' content-learning outcomes are affected by CLIL);
- context-based (occurrence and importance of external factors)

In this categorization, our research falls into the teacher-based category; nonetheless, we argue against this approach to CLIL research categorization, because of the interconnectedness of the individual aspects of CLIL. Strictly speaking, while focusing on teachers providing the data, we investigate their use of language, approach to content, culture and intend to investigate the context.

1.3 4C framework

We adopt Coyle's 4C framework as the principal underpinning of our study. In this section, we present the individual Cs, their mutual relation, and the theoretical concepts that directly relate to 4C framework. The didactic implications and models drawn from this framework will be presented in section 1.4.1 Coyle...

The 4C framework formulated identifies the key components to CLIL as Content, Communication, Cognition and Culture, positioning the first three in the vertices of a triangle to illustrate their mutual influence, and placing culture as the background of all the interactions (see Figure 3 below).

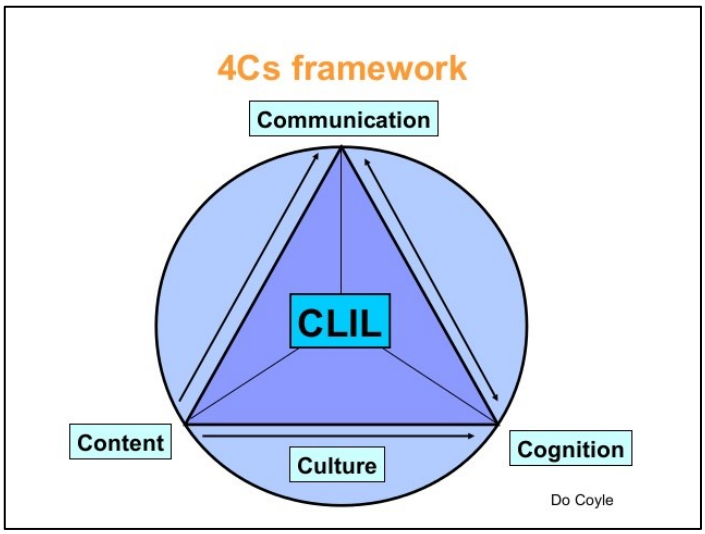


Figure 3: 4C Framework (Coyle, 2005)

Coyle later effectively extended the framework (without renaming it) by including Context, and she verbalized the interdependency between the components, claiming that effective CLIL takes place through:

- "progression in knowledge, skills and understanding of the content,
- engagement in associated cognitive processing,
- interaction in the communicative context,
- development of appropriate language knowledge and skills,
- the acquisition of a deepening intercultural awareness, which is in turn brought about by the positioning of self and 'otherness.'" (Coyle et al., 2010, p. 41; see Figure 4).

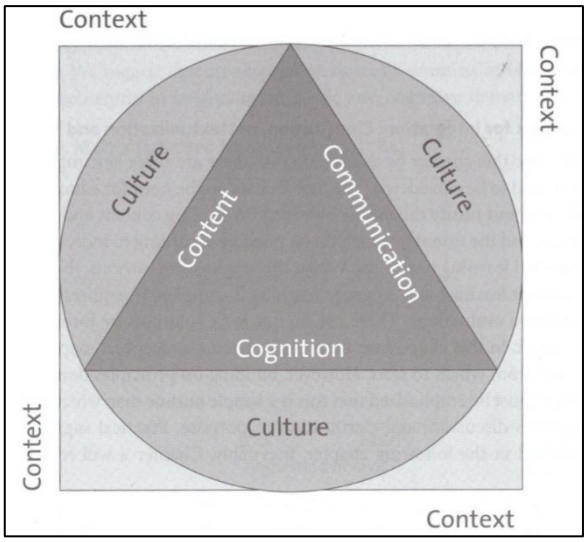


Figure 4: 4C Framework, extended with Context (Coyle et al., 2010, p. 41)

Coyle further illustrates the mutual influence of language and cognition by adapting Cummins' quadrants model (cf. Cummins 1984) to CLIL contexts, arguing for a progression from cognitively undemanding tasks to demanding ones, and from highly-contextualized tasks to more abstract ones, since abstract tasks are linguistically demanding – see Figure 5.

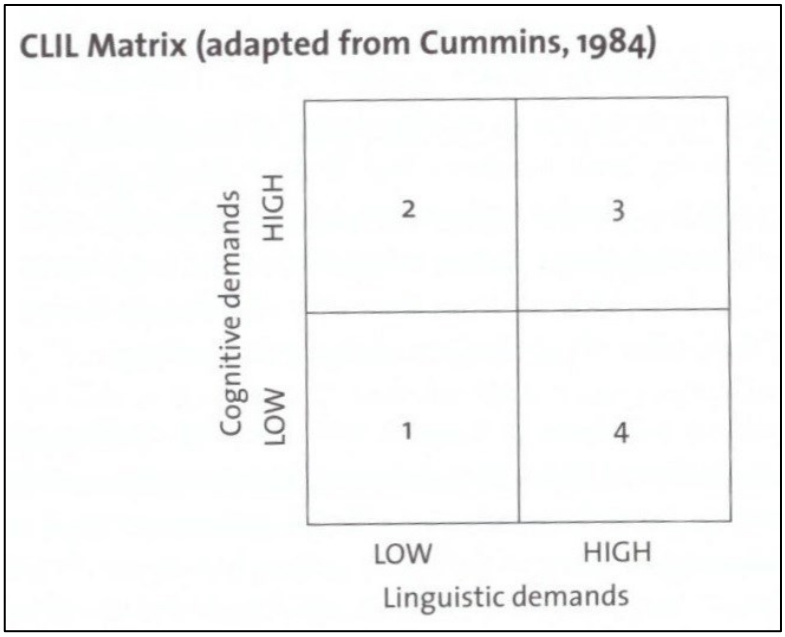


Figure 5: CLIL Matrix (Coyle et al., 2010, p. 43)

Coyle claims that “quadrant 1 might build initial confidence in learners, in CLIL it is likely to be a transitory step on the way to quadrant 2” (Coyle et al., 2010, p. 44). Consequently, to “ensure that the language of the learner does not impede learning, we need to focus on quadrant 2. Targeted progression in language learning whilst maintaining cognitive challenge will move the learner systematically over a period of time to quadrant 3.” (ibid.) Coyle et al. further warn that “demands in quadrant 4 are only appropriate only during elements of CLIL where linguistic practice and focus on form is essential progress learning.” (ibid.) In other words, the focus in CLIL should be on higher cognitive demands; low-cognitive tasks in CLIL may serve either to build confidence or to focus on language, should such a focus be a requirement for progression.

Ji Yeong & Chang (2013) give examples of activities in a Mathematics classroom for the individual Cummins’s quadrants:

1. Introduce geometrical shapes with real objects
2. Solve linear equations with one variable using weighing experiments; design a house with various ratios and proportions
3. Lecture about the properties of isosceles triangles; algebraic proof
4. Practice simple operations; memorize times tables (Ji Yeong & Chang, 2013, Table 1; numbers changed to correspond to the matrix featured in Figure 5)

Relating to Cummins’ theory of context-embedded BICS (basic interpersonal communication skills) and context-reduced CALP (cognitive academic language proficiency), Coyle et al. (2010, p. 36) completed the theoretical framework with a “language triptych”: by the language OF learning she understands the language needed to access concepts and skills of a specific field of knowledge; the language FOR learning includes classroom language as well as language for academic processes and speech acts, and the language THROUGH learning is the language generated in the process of learning: as a new meaning is learnt, new language is required and acquired (see Figure 6).

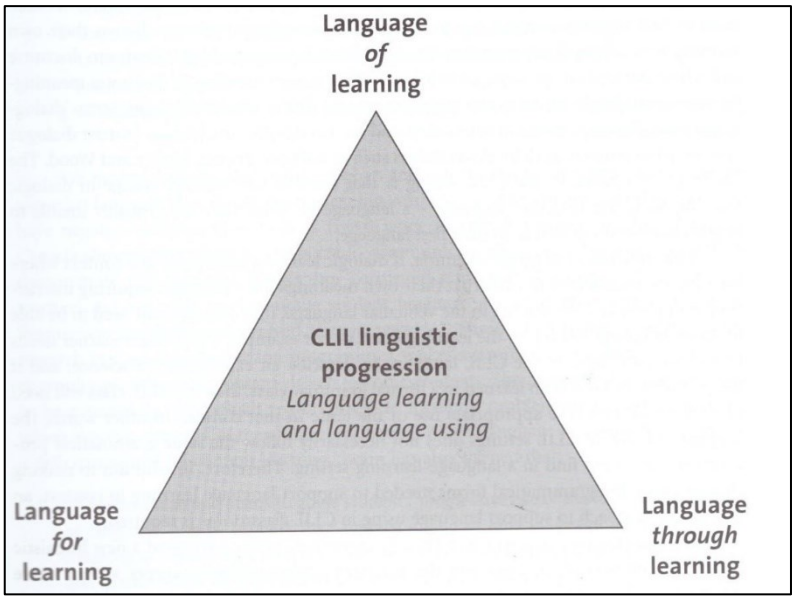


Figure 6:The Language Triptych (Coyle et al., 2010, p. 36)

1.4 CLIL teaching

In the previous section we described a theoretical model and principles of content and language integrated *learning*; in this section, we look into content and language integrated *teaching*. Hüttner and Smit (2013) claim "there is no unified CLIL pedagogy and even less a CLIL method". Marsh (Marsh in Pavesi 2001, p. 89) suggests that CLIL is not connected to a single method in education.

Grounding our study in the 4C framework, we present Coyle's ideas on CLIL teaching in most detail, and illustrate several other author's approach, as well as major teacher-training models for CLIL. We organize our listings in a chronological order; by doing so we do not intend to imply that there has been a perceivable development over time. Our aim is to identify a tractable model of CLIL teaching principles.

1.4.1 Coyle...

Coyle et al. (2010, p. 96) warn that "CLIL programmes are not about re-teaching already-learned material in another language". They hold that "CLIL teachers should stay true to their instincts as content teachers in terms of having a guiding methodology which is appropriate for the subject." and propose focusing at a CLIL unit through the 4C framework:

- Content: progression in new knowledge, skills and understanding,
- Communication: Interaction, progression in language using and learning,
- Cognition: Engagement in higher-order thinking and understanding, problem-solving, and accepting challenges and reflecting on them,
- Culture: 'Self' and 'other' awareness, identity, citizenship, and progression towards pluricultural understanding.

Coyle (2006) also detailed the connections between the individual "Cs":

1. Content matter is not only about acquiring knowledge and skills, it is about the learner creating their own knowledge and understanding and developing skills (personalised learning);
2. Content is related to learning and thinking (cognition). To enable the learner to create their own interpretation of content, it must be analysed for its linguistic demands;
3. Thinking processes need to be analysed for their linguistic demands;
4. Language needs to be learned which is related to the learning context, learning through that language, reconstructing the content and its related cognitive processes. This language needs to be transparent and accessible;
5. Interaction in the learning context is fundamental to learning. This has implications when the learning context operates through the medium of a foreign language.
6. The relationship between cultures and languages is complex. Intercultural awareness is fundamental to CLIL. Its rightful place is at the core of CLIL.

Coyle et al. (2010) explain the language triptych (see Figure 6 on page 20) from the didactic perspective. The language of learning carries the specifics of the genre/register (we elaborate on the role of language in mathematics in section 1.6 Mathematics register). Coyle et al. (2010, p. 37) underline that "for the subject teacher it requires greater explicit awareness of the linguistic demands of the subject" and voice the need of language scaffolding. On the level of the language for learning, the learner needs suitable scaffolding for "developing skills such as those required for pair work, asking question, debating…" (ibid.) Finally, the language through learning emerges as newly discovered meanings/skills are likely to require new language; Coyle et al. encourage the teacher to address emerging language structures.

1.4.2 ...and others

Lass (1988) summed up guidelines for teaching Mathematics to bilinguals well before the introduction of the term CLIL. She pointed out that it was necessary to help the learners develop their competence in both L2 and L1 and suggested using both L1 and L2 in classroom activities. She underlined the importance of teaching problem-solving strategies and using examples that would be culturally relevant from both L1 and L2 perspectives.

Darn (2006) focused on CLIL teachers from a language teaching background and suggested that CLIL lessons needed to consider both receptive and productive skills, that the content should drive the language, and learning styles need to be taken into account. Naves (2002, p. 34) lists the characteristics of successful CLIL programmes: active teachers, abundant scaffolding strategies, immediate feedback, formative assessment, integration of cognitively demanding academic content and L2, experiential learning tasks, and collaborative learning.

Mehisto et al. (2008, p. 29) summarised the core features of CLIL methodology as follows: Multiple focus, safe and rich learning environment, authenticity, active learning, scaffolding, cooperation. They added that CLIL methodology needs to be guided by outcomes related to content, language, and learning skills.

Novotná et al. (2010), working on a nation-wide CLIL-awareness-raising project by the National Institute for Education, summarized the ten key CLIL principles in the Czech context: active learner, cooperation and communication, balance between content and language, L2 scaffolding, multimodality, language as a vehicle to content learning, focus on meaning, cultivate all language skills, quality materials and classroom organization, reflection, feedback, and evaluation.

Hammond (2001) pinpoints the following key principles of the CLIL methodology: focus on language, learning and cognition; safe and enriching learning environments; authentic materials and interactions; active learning; scaffolding; co-operation.

Ball (2013) sees good practice in CLIL as a natural consequence to the teacher's effort to ensure that the students were understanding the content: "That adjustment almost always entails a reduction in teacher-talk. A reduction in teacher-talk often produces an increase in student talk (or at least it should!). These adjustments gradually find their way into the materials. These materials are by default more task-based, and therefore more learner-centred. These materials focus more clearly on the role that language plays in the students' assimilation of the concepts."

Kelly (2013) summarizes that "CLIL classroom methodology needs to be communicative, making use of a lot of visuals to embed the content in a form that learners can easily understand, it needs to have learners collaborating as much as possible, it needs to be challenging cognitively, it also needs to be sequenced in a way that moves learners from a cognitively less demanding and context-embedded position, through personal talk over the ideas, on to more cognitively challenging, less context-embedded public talk, and then on to writing."

A European Commission report on language learning effectiveness (Scott & Beadle, 2014, p. 17) sums up the features of CLIL as a language-learning approach:

- "Classroom materials that are meaningful, challenging, and authentic
- Scaffolding to reduce the cognitive and linguistic load of the content/input
- Effective intersection of content, cognition, and language
- Classroom interaction that balances listening and speaking for students
- Appropriate teacher feedback and correction
- Task-based language teaching that promotes student interaction and pushed output."

Surmont et al. (2016) identify the following specifics of CLIL: dual-focus (both content and language goals), feedback, scaffolding, learner-centred, implicit learning of language is combined with explicit learning of content, metalinguistic awareness.

Vallin (2017) lists the specifics of a CLIL teaching unit: setting the aims, selecting and adapting the materials, and scaffolding (both planned and immediate); she also elaborates on appropriate forms of evaluation for CLIL provisions.

Finally, Pérez Cañado (2017) proposes a set of CLIL teacher competences:

- linguistic competence, intercultural aspects, BICS and CALP,
- pedagogical competence, more diversified learning environments and resources, ICT[1], more transparent, holistic, and formative type of evaluation,
- scientific knowledge, mastery of the contents and of the theoretical underpinnings of CLIL,
- organizational competence, groupings and learning modalities, classroom management and control strategies,
- interpersonal and collaborative competences, the capacity to create an adequate classroom atmosphere where students receive personalized attention and feel safe and unthreatened to participate and take risks, as well as the capacity to liaise with colleagues to a greater extent,
- reflective and developmental competence – which points to the need for lifelong learning and for teachers to be constantly up-to-speed on CLIL developments.

All of the above-mentioned authors present similar principles for successful CLIL lessons. Furthermore, we want to present the outcomes of major CLIL teacher-training projects of the past decade (CLIL across Contexts, CLIL Teacher's Competence Grid, and European Framework for CLIL Teacher Education), to show that teacher training for CLIL follows the same didactic principles as the theoretical publications.

One of the outcomes of a SOCRATES-COMENIUS 2.1 project: CLIL across contexts: A scaffolding framework for teacher education (Hansen-Pauly, 2010) was an eight-dimensional framework or areas of CLIL teacher education, including Planning, Learner needs, Multimodality, Subject Literacies, Context and Culture, Cooperation & Reflection, Interaction, and Evaluation. The framework is built upon theoretical underpinnings for each of the dimensions. It specifies desired CLIL teacher knowledge, values (beliefs), and skills, and suggests specific teacher development activities and learning outcomes for each of the dimensions.

In their CLIL Teacher's Competences Grid, Bertaux et al. (2010) formulate a comprehensive framework of fourteen areas of a CLIL teacher competence: Programme

[1] Information and Communications Technology

Parameters, CLIL Policy, L2 competences/awareness for teaching CLIL, Course development – including CLIL core features, Partnerships in supporting student learning, Integration, Implementation: Lesson planning, Second Language Acquisition (SLA), Interculturality, Learning environment management, Learner focus, Learning skills focus, Learning assessment and evaluation in CLIL, Lifelong learning.

The European Framework for CLIL Teacher Education (Marsh et al. 2012) is based on various countries' teacher training for CLIL. It describes the professional competences and serves as a model and a tool for guiding the design of curricula for CLIL teacher professional development. The framework states eight professional competences and identifies teachers' abilities with respect to the following areas: Personal reflection, CLIL fundamental, Content and language awareness, Methodology and Assessment, Research and evaluation, Learning resources and environments, Classroom management, and CLIL management.

All of the programmes include not only the well-documented CLIL teaching principles but underline the importance of teachers as reflective practitioners and active members of a wider CLIL community; they also highlight the role of the CLIL teacher as the manager and facilitator, responsible for a safe and enriching learning environment, and as the material creator/selector/adaptor.

1.4.3 Summarizing CLIL teaching

We hold that while the general concept of content and language integrated *learning* might bring along controversy and difference of opinion on the theoretical and academic level, most authors, including theoreticians, researchers, didacticians, teacher-trainers and teachers themselves highlight similar aspects in CLIL *teaching*. While the authors choose differing perspectives, divergent priorities, and investigate the methods and strategies for effective CLIL at a variety of depths, there seems to be a universal agreement that CLIL:

- needs to cater for content and language, as well as for learning and thinking skills,
- language-learning in CLIL is content-driven and meaning-oriented, the language of instruction serves as a vehicle to the content,
- teacher needs to be aware of different levels of language in a CLIL classroom, all instances need to be scrutinized for language demands, and scaffolding is a quintessential teaching strategy,

- materials and activities should be learner-oriented,
- learning should be experiential, task-based, problem-oriented,
- teacher should provide rich multimodal input and encourage cooperation.

All in all, looking back at Coyle's elaboration of the 4C framework, we agree with Sepešiová (2015, p. 151) who argues that „understanding how CLIL works can give teachers the necessary knowledge of how to prepare CLIL lessons. "

1.5 Scaffolding

By scaffolding we understand each and every instance of support that is being consciously provided to the learners to cope with the target language and tasks. These may include for example a vocabulary list, allocating more time for solving a problem, using visuals and manipulatives, ICTs, reformulating, checking for comprehension, providing sentence structures and innumerable more supportive techniques and tools. The support is meant to be temporary, and its goal is for the learner to gradually gain independence in dealing with the given task, so that the next time they meet a similar challenge they need less and less assistance (cf. Gerakopoulou, 2011; Gibbons, 2002; Walqui 2006).

Scaffolding is entailed in the Vygotskian concept of the zone of proximal development (ZPD, cf. Chaiklin, 2003) and Bruner's (1976) socio-constructivist theory. Dafouz, Llinares & Morton (2010) explain that "the scaffolding metaphor refers to the type of assisted teaching/learning that emphasizes interaction with peers and teachers in moving learners from their existing level of performance to a level of independent performance." Scaffolding naturally takes place in monolingual lessons, too. Different aspects of scaffolding are discussed: Huynh (2017) distinguishes three kinds of scaffolding based on what tools the teachers employ, he speaks of sensory, graphic, and interactive scaffolding.

We understand that some forms of scaffolding are intrinsically part of any teaching/learning; nonetheless, their role in CLIL is paramount. Marsh even used the notion of scaffolding to define CLIL: "The term [CLIL] was adopted in Europe during 1994 to help professionals explore the types of good practice and sometimes very

significant outcomes being achieved where scaffold methodologies were used to learn both language and authentic content." (Marsh & Frigols Martín, 2012, p. 2).

Ball points to the fact that in materials design, key language is deliberately weaved into the learning material and ultimately serves the same purpose as scaffolding – to have the learners "see the key vocabulary and structures often, in a variety of contexts, and eventually begin to use them naturally" (Ball et al., 2015, p. 197). Ball calls this strategy "embedding" and draws a line between embedding and explicit scaffolding. In line with Ball et al., we only take account of explicit scaffolding in the lesson plans analysed.

Meyer (2013, p. 299) specifies the importance of scaffolding in CLIL:

1. "It reduces the cognitive and linguistic load of the content/input (= input-scaffolding) which means that scaffolding helps students understand the content and language of any given material.
2. It enables students to accomplish a given task through appropriate, supportive structuring.
3. Scaffolding also supports language production (= pushed output) by providing phrases, subject-specific vocabulary and collocations needed to complete assignments. It helps students to verbalize their thoughts appropriate to the subject matter. In other words, scaffolding done right will boost students' cognitive academic language proficiency (CALP)."

In our study, Meyer's approach is partially used. Input and output scaffolding will be recorded, considering whether the aim of a given scaffolding strategy or technique is to help learners understand (input scaffolding), or to "verbalize their thoughts appropriate to the subject manner" (content scaffolding; Meyer, 2013, p. 299).

Dale, van der Es & Tanner (2010) distinguish between immediate, contingent scaffolding, and built-in, planned scaffolding. Lesson plans evidence only contingent scaffolding, and even then, they may not cover all the instances of scaffolding the teacher had considered/planned for the particular lesson, which is a limitation of our insight in scaffolding.

1.6 Mathematics register

Having illustrated the relevance of scaffolding in CLIL, in this section we detail the specifics of mathematics register and draw attention to the importance of language in mathematics.

Despite not being the first-choice option, Mathematics is frequently selected for CLIL (Kubů et al., 2012). It has even been explicitly mentioned by the Czech Ministry of Education and Sports as a subject suitable for CLIL (Ministerstvo školství, 2009). Moreover, two out of seven CLIL teacher-training courses in the Czech Republic take place at Departments of Mathematics (Vallin, 2017, p. 36-37).

Nevertheless, there are specific challenges to learning/teaching Mathematics in L2. Already in 1984, Cabello asserted that "a standardized test of mathematics or science administered in English to ELLs[2] is just as much about the student's language proficiency as it is about his/her knowledge of mathematics or science" (Cabello, 1984, p. 20; footnote added).

Pimm (1987, p. 76) stresses that "Part of learning mathematics is learning to speak like a mathematician, that is, acquiring control over the mathematics register." Pimm argues that unlike in the case of a language, there are no native speakers of mathematics.

Barton et al., speaking of L1 learners, point out that "reading mathematics and science requires special reading skills—skills that students may not have used in other content areas. For example, in addition to comprehending text passages, students must be able decode and comprehend scores of scientific and mathematical signs, symbols, and graphics. Students also need to read and interpret information presented in unfamiliar ways—not only left to right, but also right to left (number lines), top to bottom (tables), and even diagonally (graphs)." (Barton et al., 2002, p. 24)

Schleppegrell (2007) synthesizes research on the linguistic challenges of mathematics learning, noting multiple semiotic systems and grammatical patterns of mathematics register. She strongly advocates for the support of the development of the mathematics register, arguing that "Learning the mathematics register takes time, and teachers need to

[2] English Language Learners

set goals that scaffold the development of precise ways of using language over lessons and units of study," (Schleppegrell, 2007, p. 154). Talking about foreign languages and mathematics, she makes it explicit that "If the language of instruction is not the students' home language, teachers face additional demands in supporting the development of the school language and the mathematics register." (ibid., p. 153).

Moschkovich (1999, p. 11) points out that Mathematics entails a variety of linguistic competences: "explaining solution processes, describing conjectures, proving conclusions and presenting arguments." Dale & Cuevas (in Crandall, 1987, p. 12) detail that mathematics register "includes unique vocabulary, syntax (sentence structure), semantic properties (truth conditions), and discourse (text) features". Brunner points out that mathematics presents "an almost totally nonredundant and relatively unambiguous language" (1976, p. 209). Corasaniti Dale & Cuevas (in Crandall, 1987, p. 25) illustrate the extra challenge that different aspects of mathematical register might have for the students: "Some students may, for example, have considerable difficulty solving the following problem stated using a hypothetical situation signalled by if: If Frank can type a page in 20 minutes, how much time will it take him to type two pages? However, the same students may be able to solve the problem when it is stated using a declarative sentence, as in: Frank types one page in 20 minutes. How much time does it take him to type two pages?". They argue that a mathematical text in L2 would present a challenge for L2 learners even if their command of general L2 was high.

Bye (in Crandall 1987, p. 21) asserts that written mathematics texts:

- are conceptually packed;
- have high density;
- require up-and-down as well as left-to-right eye movements;
- require a reading rate adjustment because they must be read more slowly than natural language texts;
- require multiple readings;
- use numerous symbolic devices such as charts and graphs;
- and contain a great deal of technical language with precise meaning. (Bye, 1975 as cited in Crandall 1987, p. 21).

Pimm & Keynes (1994) distinguish four levels of language in mathematics:

- common classroom language; the teacher may suppose that the learners many of the expressions know and use correctly,
- mathematical register: special mathematical terminology (equilaterals, polynomial…), notions that acquire a different meaning from common speech (such as "odd", "product" etc.), and notions where their mathematical meaning is derived from their common usage (such as "similarity" etc.)
- textual language (textbook, word problems etc.)
- symbolic language.

Looking back at Cummins' quadrant theory adapted to CLIL environment by Coyle (cf. Figure 5: CLIL Matrix (Coyle et al., 2010, p. 43) on page 18), Pimm & Keynes' levels also reflect different fields of linguistic-cognitive demands.

Leisen elaborates on the levels of language in mathematics and classifies representations by their level of abstraction (see Figure 7 on page 31 for the infographic), placing the mathematical representations at the top of the abstraction scale. Leisen's overview can provide a useful framework for scaffolding possibilities; however, it also encompasses the linguistic challenges connected to context-reduced academic language (cf. Cummins, 1984). A CLIL Mathematics teacher should be acutely aware that scaffolding of a higher level of abstraction may constitute a linguistic support but at the same time, a cognitive challenge. Leisen further argues that "Mathematical understanding can only be activated, negotiated and consolidated through language in concrete situations where the classroom language can be seen as a mediating language between everyday language and the specifics of the discipline's register (Leisen, 1999, paraphrased in Viebrock, 2009, p. 68). Crandall suggests a very important implication of the register complexity for learning/teaching, especially valid in CLIL contexts: "It is important to remember that when talking about the vocabulary of the mathematics language register (or any register), the meanings of the terms are related to the context in which they are used. Hence it is not enough for students to learn lists of words." (Crandall 1987, p. 20).

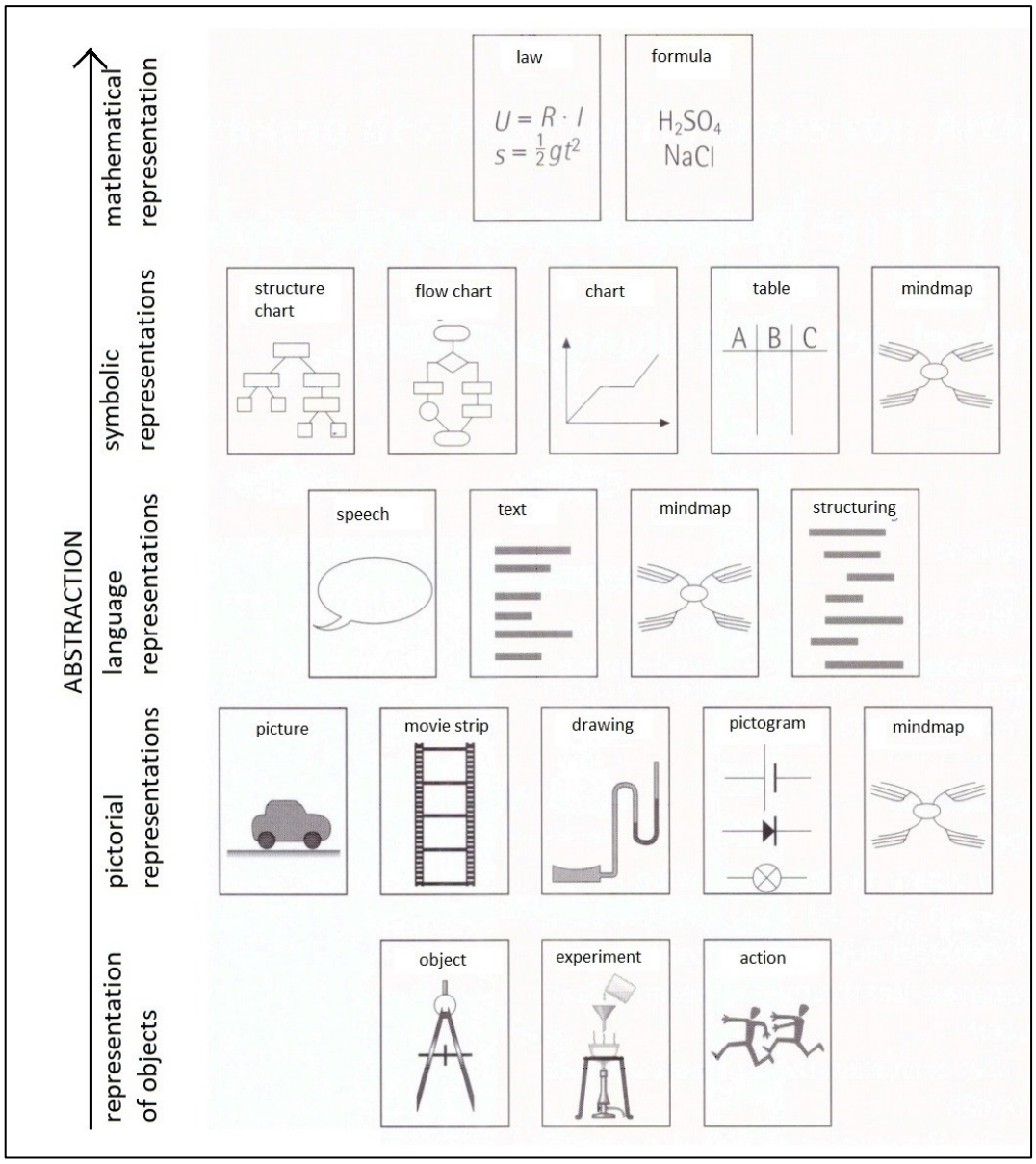


Figure 7: Levels of abstraction in representations, translated from Leisen, 2005, p. 71)

Hejný (1990, p. 26) understands a language as a system of symbols through which thinking and communication is executed. Hofmannová & Novotná (2005, p. 5) claim that it is necessary to investigate the connection of thinking and its verbalization and point out three possible disruptions to the thinking-speaking connection: either an incorrect notion is assigned to words/symbols, or there is no notion for the words/symbols, or the notions and ideas lack linguistic representation. Šteflíčková (2012) follows this framework and focuses on diagnostics of students' difficulties in CLIL.

Research shows that when language is addressed adequately, learners can achieve higher success rate in content evaluation. For example, Brown & Ryoo (2008) designed an experimental science lesson taught with everyday language prior to using scientific language. They confirmed that "students taught using a content-first approach not only attained a better conceptual understanding (...) but also developed a greater understanding and command of scientific language" (Brown & Ryoo, 2008, p. 549). Kiplinger et al. (2000, p. 13) in their research on almost 1200 learners' performance in mathematics tests found that "simplification of linguistic structures and the addition of a glossary for non-mathematics vocabulary to a math assessment results in better performance by English language learners and other students who are not good readers." In another study, Abedi, Lord, and Hofstetter (1998) examined the impact of language modification on the mathematics performance of L1 speakers and L1 learners (specifically, English native speakers and Spanish native speakers/English learners at an English-speaking school) on a sample of 1,394 eighth-graders in schools with a large number of Spanish speakers enrolled. Results showed that modifications to the language of test items contributed to overall improved performance on 49% of the items. The L1 learners generally scored higher on shorter/less linguistically complex problem statements. In yet another large-scale research, 1174 8th grade students were given test items from the National Assessment of Educational Progress mathematics assessment, along with test items where the linguistic complexity was reduced. In interviews, students typically preferred the revised test items over the originals (Abedi & Lord, 2010).

To sum up, mathematics learning entails an abundance of linguistic specifics that need to be catered for through adequate scaffolding. The variety of levels of representations used throughout mathematics classroom allows for many authentic types and forms of scaffolding – nevertheless, teachers need to be aware also of the cognitive challenge the different representations encompass. In our research, we will focus on different forms of explicit input and output scaffolding.

2 Methodology

Previously, section 1.2 Research of CLIL placed our study on the grid of current CLIL research. In this section, our research questions are formulated, and the research design explained. Content analysis is explained as the central methodological approach adopted by this exploratory study. Stages of the research are described, as well as the procedures in the individual steps. The sample and the variables are presented, and limiting conditions are given. As the LPAT is central to our research, independent sections are dedicated to its genesis, development and description.

2.1 Research questions

The general aims of this thesis are

- to identify the key characteristics of a CLIL lesson plan,
- to analyse the manifestations of teachers' understanding of CLIL in their lesson plans,
- to ascertain whether these manifestations depended on teacher qualification,
- to establish whether the lesson plans comply with CLIL principles.

Formulated as specific **research questions:**

1. **Do the Czech teachers' lesson plans feature the key characteristics of a CLIL lesson plan? What other characteristics manifest in the lesson plans?**

2. **Does the Czech teachers' conception of a CLIL lesson plan match the key characteristics of a CLIL lesson plan? If not, where do *they* see the focal points of a CLIL lesson plan?**

3. **Do the Czech teachers' lesson plans feature the teachers' own "key characteristics" of a CLIL lesson plan? Are the teachers consistent in what they claim to be the key characteristics, and in what they employ?**

4. **Are there any differences (in terms of research questions 1 & 2) between the teachers of L2 and teachers without a L2 teaching qualification?**

2.2 Research design

The design of our mixed-methods research consists of three principal steps: first, the development of the Lesson Plan Analysis Tool, piloting, and the content analysis of the lesson plans using the tool.

Both qualitative and quantitative approaches were adopted in past researches to the investigation of lesson planning. The following paragraphs explain why we chose the mixed-methods design.

Qualitative methods offer deeper insight in the aspects of the lesson plans or the planning process: for example, Peterson (1978), Kerr (1981), Li, Chen, & Kulm (2009) or Remillard (2018) employ predominantly qualitative approaches to investigate teachers planning. They do so on small samples, typically analysing the "thinking aloud" of individual teachers and focusing on the process of planning rather than the final output. However, we were aiming for a design that would allow for a within-cohort comparison of finished lesson plans rather than for a narrative exploratory study on teacher planning. Since there is no uniformity of CLIL implementation and nothing as a "typical" CLIL teacher, we aimed to investigate the shared attributes of the lesson plans across the CLIL continuum.

Quantitative research on teachers' lesson planning has been carried out either in experimental settings (cf. Shimizu, 2008 in Mathematics; Mäkiranta, 2014 in CLIL) or on a largely homogeneous sample, such as teacher trainees (cf. John, 2006, Mutton, Hagger & Burn (2011). With the limited extent of CLIL implementation, predominantly in case of a specific content subject, we were bound to base our sample on availability. This did not allow us to work with a homogeneous sample, thus hampering the validity and reliability of any quantitative approach. We followed Shimizu's (2008) experimental setting in the sense that we had the teachers create lesson plans tailored to the context of our research; unlike Shimizu, we did not limit the time nor the resources that the respondents used when creating the lesson plans.

Johnson investigated "to what extent are ESL[3] teachers' instructional practices consistent with their theoretical beliefs about second-language learning and teaching" (Johnson,

[3] English as a Second Language

1992, p. 85). She included a lesson plan analysis task in her study of teacher beliefs: the teachers read three separate instructional lesson plans and were assigned a code based on the type of lesson plan – or rather the methodology – they selected. In our context, we intend to adopt a reverse approach to answer to the same question: we assign the teachers a pedagogical approach, and by analysing the lesson plans created we investigate their understanding of it.

There have been frameworks proposed for lesson plan analysis. However, none of them addresses all the aspects that we aimed for. Lesson-planning categories offered by Harmer (1991) or Scrivener (2010) for ESL do not take into account the content dimension and do not fully cater to further specificities of CLIL context. Panasuk's analytic tool (Panasuk et al. 2002, Panasuk & Todd, 2005), as well as Mutton's (2011), Resnick's (1975) or Nováková's (2014) materials focus on teachers as material designers in the context of Mathematics and include lesson plans in their research. All of them suggest descriptive categories for lesson plans; however, all are intended for a monolingual environment, and fail to capture the complexity of a CLIL context. Moreover, they work from a different theoretical perspective, for example, Panasuk investigates the lesson plans through the FSLP framework, and Nováková employs the theory of didactic situations.

Banegas' (2015) research on CLIL lesson plans is probably the closest to our setting. He investigates 39 lesson plans through qualitative content analysis and accompanies his study with an online survey based on Dale & Tanner's (2012, p. 15–18) checklist. However, there are several major differences in Banegas' setting: he explores CLIL from the language-driven perspective: his sample are future L2 teachers only, and the categories for his content analysis cater to L2-teaching context (he records learners' level, structure, content, language, aims, language activities, content activities, and materials). The lesson plans were intended for 80-minute lessons (typical lesson length in Argentina). Moreover, we find Dale & Tanner's checklist used by Banegas unsuitable for our research for two reasons: first, the formulation of the question and the Likert scale used for frequency of a specific CLIL feature in the lesson in our opinion threaten to influence the reliability of the research since the teachers might tend to describe their "ideal" of a CLIL

teacher instead of a real classroom behaviour. Second, the checklist concerns both planning and actual teaching, while we focus on the finished lesson plans rather than the process of their creation and implementation.

All in all, it was decided to create an original analytical tool to match the purposes of our study. Figure 8 presents the mixed research design of our study, details of individual components are in the respective sections of this chapter. We used concurrent triangulation design (Creswell & Creswell, 2017) in the phase of the development of the Lesson Plan Analysis Tool (LPAT), combining the content analysis of published resources with a qualitative questionnaire. For the pilot study, concurrent triangulation design was used as well, employing content analysis of the lesson plans and triangulating the data with a quantitative questionnaire data. As a result of piloting, the LPAT was adapted. In the main study, content analysis of the lesson plans and the quantitative questionnaire based on the new LPAT were used.

Data was correlated on three levels: lesson plans data was related to the key characteristics of a CLIL lesson plan (the CLIL lesson plan model), to establish whether (or how) the lesson plans reflect the model (Research question 1); by cross-checking the questionnaire data against the model, we intend to answer our research question n. 2; the correlation of lesson plan data and questionnaire data aims at answering research question 3. Finally, the sample was split in two cohorts (L2 teachers and teachers with non-L2 qualifications), and the three levels of correlation of data were employed to investigate the inter-cohort differences, catering to Research question 4 (it was not possible to carry out this last step in the piloting, see section 4: Pilot study on page 74 for details).

Due to the qualitative nature of the analysis and the size of the sample, simple statistical tools were used (measures of central frequency, Pearson correlation coefficient). The statistical calculations were done in Microsoft Excel and double-checked using the Social Science Statistics website tools.

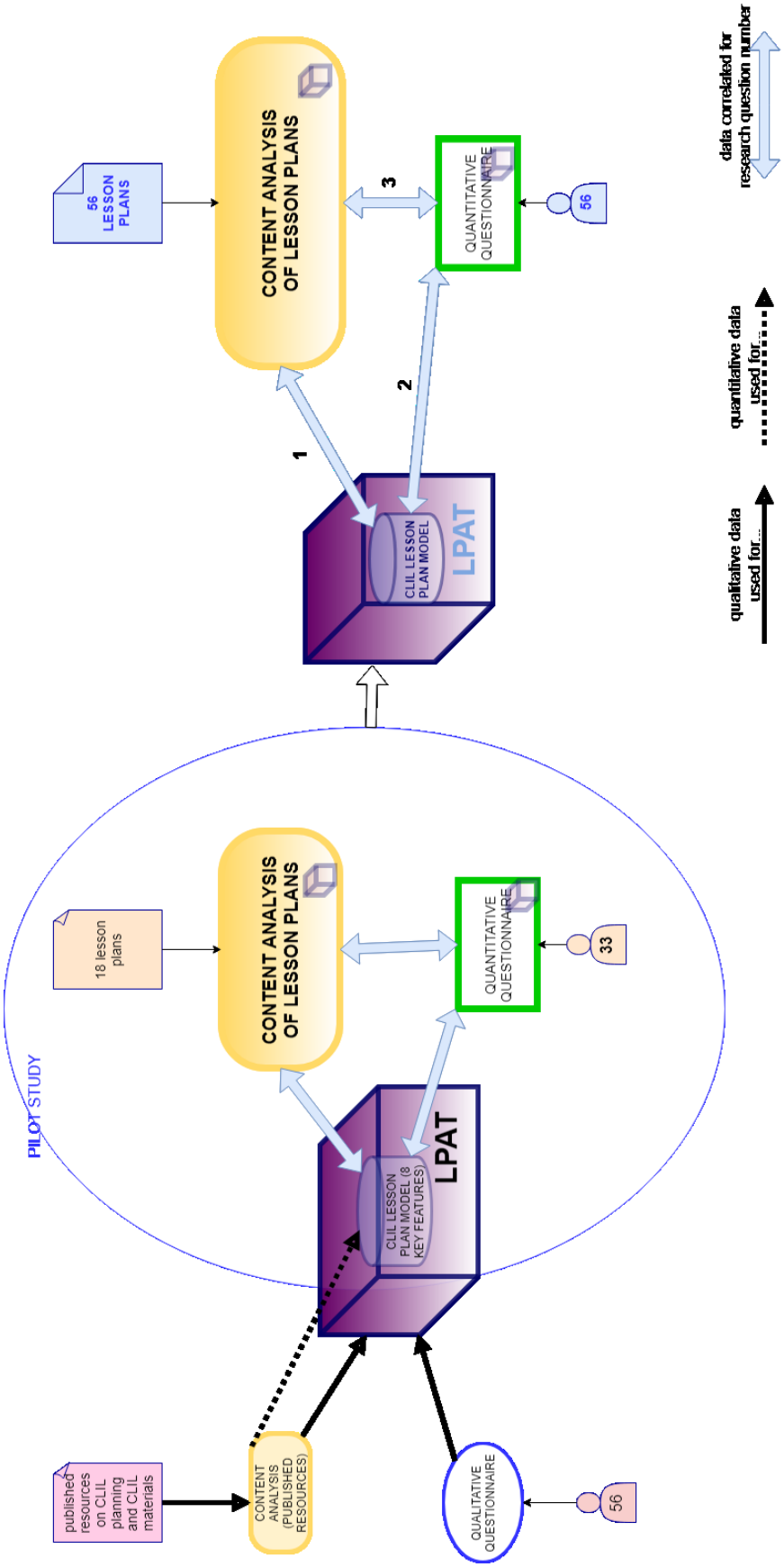


Figure 8: Research design

2.3 Stages of research

This list presents the sequence of stages of our research and links the steps to sections of this thesis.

1. Resources were researched to establish the wider theoretical framework (see Chapter 1: Theoretical framework),
2. selected resources were analysed to formulate the universal criteria of LPAT and to identify the features of the CLIL lesson plan model (see sections 3.1 through 3.5),
3. qualitative questionnaire was used to define the local criteria of LPAT (see section 3.6),
4. LPAT was designed (see section 0),
5. quantitative questionnaire was piloted (see section 4.2),
6. lesson plans were collected for piloting and coded (see sections 2.9 and 4.3),
7. data from the piloting was discussed (see sections 4.4 and 4.5),
8. adaptations to the LPAT, questionnaire design, and the overall research design were made (adopting concurrent triangulation design, Creswell & Creswell, 2017, for the main study; see Chapter □ for LPAT adaptations),
9. lesson plans were collected, and questionnaires self-administered (see sections 2.8 and 4.2),
10. lesson plans were coded (see section 2.9),
11. data analysis was carried out (see Chapter 0).

2.4 Content analysis

The primary method employed throughout the study is content analysis, a "technique for making inferences by objectively and systematically identifying specified characteristics of messages" (Holsti, 1969, p. 14). Content analysis is employed both to spoken and written communication: it allowed us to examine the lesson plans systematically, while working with qualitative categories and in a qualitative paradigm.

Berelson (1952, p. 18) defines content analysis as an “objective, systematic and quantitative description of the manifest content of communication. In the definition, four key principles are highlighted: the content must be *manifested* in the document, by

objective description the analysis of well-defined content categories independent on the researcher's motivation is understood; *systematic* description promotes relevant categories and sound principles, and the frequency of data or another *quantitative* approach is used for the analysis (Švec, 2009, p. 141-2).

Švec (2009, p. 142) points to the fact that the original quantitative aspect of content analysis is broadened to include for example the correlation of variables; he argues that in educational context the qualitative aspect of content analysis is dominant. He suggests that "the goal of content analysis is to create conclusions, judgments, implications, deductions or conjectures through the objective identification of qualitative and quantitative characteristics" (Švec 2009, p. 143).

George (1959, paraphrased in Švec, 2009, p. 143) lists the following aspects of qualitative content analysis:

1. Preparatory reading of the materials to formulate hypotheses and identifying relationships,
2. effective procedure for observing the characteristics of the content of the texts (contrasted with a systematic procedure required by quantitative approach),
3. dichotomous attributes,
4. flexible method of descriptive observation or for coding evaluative judgments.

Švec (2009, p. 142) finds the qualitative and quantitative approach to analysis complementary and holds that qualitative analysis is typically employed in education science. In agreement with him, we follow these principles in our content analysis:

1. The goal is to formulate hypotheses and identify relationships.
2. A systematic observation of the characteristics will be carried out.
3. Only dichotomous attributes will be observed.
4. The coding and observation is flexible; however, descriptive observations and evaluations are separated.

Stemler (2001) points out that content analysis "also allows inferences to be made which can then be corroborated using other methods of data collection" – our research complies with this aspect of content analysis and complements it with a quantitative questionnaire (Chráska, 2016) designed so that its items mirror the observable categories employed in the lesson plan content analysis.

2.5 Variables

Six independent variables were monitored: age, years of teaching practice, L2 level, teacher qualification (L2 – Mathematics – other), CLIL practice, and gender.

An original rubric, the Lesson Plan Analysis Tool (LPAT), was developed, identifying the following dependent variables (see section 0 for the details of LPAT used in piloting and Chapter □ for the full version used in the main study):

- Key features of a CLIL lesson plan (CLIL lesson plan model)
- Further features of a CLIL lesson plan
- Evaluative features

2.6 Sample

526 participants of a CLIL training at National Institute of Further Education and 94 participants of CLIL courses at the Faculty of Education were invited to join in the research. Out of these 620 people, 127 replied and of these, 71 agreed to participate in the study. Fifteen of them did not complete the requirements for various reasons. Altogether, we present a research on 56 respondents. The constants of the sample based on availability are:

- At the time of the data collection, they were teachers at Czech schools,
- Czech is their L1,
- they undertook a CLIL course at National Institute for Further Education or Faculty of Education, Charles University in Prague,
- they have taught year 9 learners (learners in their final year of compulsory education) at least once,
- they were willing to provide a CLIL lesson plan on financial mathematics/financial literacy for the study.

Section *6.1 Sample* presents the characteristics of the sample based on the independent variables.

2.7 Lesson Plan Analysis Tool

- To provide a systematic framework for the purposes of the lesson plans content analysis, an original tool (referred to as Lesson Plan Analysis Tool, LPAT) was developed. The design of the LPAT was based on Tomlinson's framework of

universal and local criteria (Tomlinson, 2013; 2018, p. 59). Universal criteria were identified through content analysis of published resources on CLIL and on lesson planning evaluation, and local criteria were based on qualitative survey among Czech teachers and teacher trainees (see section 3.6 Local Criteria for details on the procedure). Eight key characteristics were identified in the qualitative content analysis to describe a CLIL lesson plan model, complemented by further 17 characteristics of a CLIL lesson plan. These twenty-five items guided the design of both the questionnaire and the lesson plan analysis. The LPAT characteristics were used as a multiple-choice item of our questionnaire; the respondents were prompted to select up to eight features (in parallel to the eight key features of the CLIL lesson plan model). The detailed procedure of the LPAT development and the individual items are described in chapter 3: Developing the LPAT, and its adaptation based on the pilot study (including detailed definitions of the items) in chapter 5.

2.8 Questionnaire

The same structure of the questionnaire and identical administration procedure was used both in the pilot study and in the main study.

The questionnaire was self-administered on the Google Forms platform, by which anonymity was secured (Google Forms does not record IP addresses or any other form of identification of the respondents), and the data was saved in a cloud. The respondents could have selected any time for filling in the questionnaire, and the time spent over the questionnaire had not been limited nor measured, nor did we record the order in which the respondents selected the individual items.

The questionnaire consisted of four parts presented on four consecutive pages. The completion of each page was required to continue to the next one.

We inquired facts about the respondents (completion of all fields was required):

- open questions: age; years of teaching practice,
- single-choice from a pop-up list: self-assessed level of L1,
- dichotomous single-choice: teaching practice; L2 teaching qualification, Mathematics teaching qualification, CLIL practice; gender.

The main section of the questionnaire listed all the LPAT criteria (see section 5.2 Changes in the categories for the final items and the pop-up texts that accompanied them in the questionnaire) in a multiple-choice option, inviting the respondents to select up to eight items as an answer to our question "What are the features of a CLIL lesson plan?"[4] The number of items allowed was guided by the eight Key criteria established in the LPAT; the settings of the online form controlled the maximum number of selected items; the lowest number of answers was not set (neither in the instruction or in the software). The sequence of the items was randomized by Google Forms for each respondent individually, to mitigate the or the question-order bias (cf. primacy response order, Malhotra, 2008). A text field open item ("Other") was added as the last in the list.

2.9 Lesson plans coding

Following Weber's (1990) a priori coding, we scrutinized the lesson plans for the previously established items of the LPAT, recording their frequency.

In the pilot study, the first seven lesson plans were evaluated by the author of this thesis and her colleague (a PhD student at Department of English Language and Literature) who had extensive CLIL teaching experience. The author of this thesis has experience with CLIL on the content-guided side of the continuum, while the second evaluator had engaged in CLIL on the language-driven pole of the spectrum. Both were working independently with identical descriptors of the individual features. A separate recording sheet was prepared for each lesson plan, filled in by each researcher. After each lesson plan, eventual discrepancies in the categorization of the features of a lesson plan were discussed between the two evaluators, and consequently the description of the category (or categories) in question was adapted, or a new item was added, to ensure reproducibility of the coding. Whenever an item was modified or added, the previously analysed lesson plans were scrutinized again by the two researchers for the sake of the stability of the coding – to make sure that the original categorization did not change with the adaptation of the referential LPAT. Eventually, the two evaluators reached full consensus on the categories identified.

In the main study, the data was coded only by the author of the thesis using the LPAT categories. Apart from that, the procedure was identical.

[4] Formulation used in the main study; in the pilot study, we used "…features of a good CLIL lesson plan."

2.10 Research limitations

Our research is necessarily influenced by the sample based on availability. While it may provide insight in the lesson plans of our sample, it only allows us to formulate hypotheses towards the population of Czech CLIL teachers.

Our research focuses on lesson plans as products, and only considers their written form. It is well possible that the respondents left some of the lesson plan features out from the written form even though they had pondered on them. The tools selected – content analysis and quantitative questionnaire – do not allow for the investigation of the background, and qualitative approaches would have to be employed (such as interviews with the participants) to complete the data.

As for the questionnaire, one limitation is that the perspective from which to consider the lesson plan features was not specified (and we did not collect any data that would shed light on the individual teachers' perspective – meaning, we have no information about whether they were identifying features of "an ideal CLIL lesson plan for me", "a universal CLIL lesson plan", "features that others would appreciate", or "if it was me, I would include…", nor about which characteristics of a CLIL lesson plan the respondents might have taken for granted). Another limitation comes with the 25 multiple-choice items. It is possible that the respondents' answers were influenced by the length of the list: we mitigated the primacy response order effect (cf. Malhotra, 2008) by randomizing the order of the items. Finally, the questionnaires were translated to Czech for the respondents' convenience. We used two English teachers with extensive academic experience to check the translations to avoid potential loss or distortion of information.

The fact that the lesson plans were coded by one person only may be considered a limitation, too. Employing a second researcher for the main body of the research was not possible due to personal and temporal reasons.

2.11 Ethical issues

In all stages of the research, the respondents gave active informed consent to participate in the study. They were informed about the scope and the context of the research and will be given access to the text of the thesis. They were free to refuse to participate or to leave the research at any moment. The participants usually sent their lesson plans using a personal email; the lesson plans were downloaded and saved under a random code, the

participants then used this random code to log in to the questionnaire. Every author whose work is used as an example in this thesis agreed to parts of their work being published (anonymously).

3 Developing the LPAT

This chapter explains the genesis of the tool. It starts by particularizing Coyle's models for CLIL planning and adds further authors and projects that target CLIL planning and materials from different perspectives. Sections 3.5 and 3.6 describe the identification of universal and local criteria. The chapter closes with the description of the LPAT and the embedded CLIL lesson plan model.

In the preliminary phases of our lesson plan study, a content analysis of existing CLIL lesson plans was tentatively used to identify the individual features of a lesson plan (see Procházková, 2015 for details). This approach was abandoned for Tomlinson's (2013, 2018) model of universal and local evaluation criteria. Tomlinson (2018, p. 59) postulates that to create universal criteria for evaluation of materials "evaluators should generate a list of beliefs that they hold (...) and then to transform these beliefs into criteria for evaluating materials." In sections 3.1 through 3.4, we scrutinize a variety of resources to cover the full complexity of a CLIL daily lesson plan, and we tabulate the frequency of individual features, concluding with singling out our key universal criteria. Content analysis of Czech teachers' and teacher trainees' responses to "What do you expect in a CLIL lesson plan?" was used to identify the local criteria.

3.1 CLIL planning

In Chapter 1, the general theoretical framework of CLIL learning and teaching was laid out. In this section, we will focus on planning for CLIL. Ramiro & Perez (2010, p. 3) argue that Coyle's 4C framework "offers a sound theoretical and methodological foundation for planning CLIL lesson" (cf. Sepešiová, 2015).

Coyle (2005, p. 4) holds that the content is the starting point of the planning process and underlines that "it is useful to think of the project in two ways: the teaching aims/objectives and the learning outcomes." She proposes the 4Cs planning guide:

1. "Start with content. Define it.
2. Now link content with communication. (What language do they need to work with the content? Specialized vocabulary, language for tasks and classroom activities…)

3. Now explore the kind of thinking skills you can develop according to decisions made above. (Which tasks will I develop to encourage higher order thinking – what are the language as well as the content implications?)
4. Culture is not a post script but rather a thread which weaves it way throughout the topic. (What are the cultural implications of the topic? How does the CLIL context allow for 'value added'?)" (Coyle, 2005, p. 6)

Montalto et. al designed a "5C planning framework" for CLIL lessons, claiming that "When teachers are planning a CLIL lesson, there are five things to think about – Content, Communication, Competences, Community and Cognition." (Montalto, 2014, p. 20). The five aspects are elaborated in the framework:

1. Content: logical development of the area the students have been working on, students build their content knowledge,
2. Communication: What sort of communication will the students be involved in? What language will be useful for that communication? What key content words will they need? What scaffolding can I provide?
3. Competences: can-do statements, about lesson content, skills, and new language
4. Community: CLIL teachers help students to relate what they learn to the world around them,
5. Cognition: triggering higher-order thinking skills (Montalto, 2014, pp. 20-22).

Meyer elaborates the 4C framework further and proposes six principles of quality of planning/designing a teaching unit and the CLIL pyramid (see Figure 9). He holds that these principles "are intended to help CLIL teachers enrich their lessons and materials while the CLIL-Pyramid offers a proven sequence to incorporate those principles in their CLIL-units" (Meyer, 2013, p. 310). The six principles are as follows (with Meyer's detailed elaboration on Sustainable Learning):

1. Rich Input,
2. Scaffolding Learning,
3. Rich Interaction and Pushed Output,
4. Adding the (Inter-)cultural Dimension,

5. Make it H.O.T.,
6. Sustainable Learning:
    - create connections to students' attitudes, experience and knowledge,
    - make the learning process transparent and provide clear structuring,
    - make sure that results of group work are shared with all students of the class (through posters, blogs, learning diaries, websites etc.),
    - promote autonomous learning and introduce (digital) portfolio work,
    - make strategic use of the L1 to support the learning process,
    - move away from isolated words and word lists and focus on collocation and chunks instead,
    - promote spiral learning and put great emphasis on learning and study skills.

Meyer continues by explaining his CLIL Pyramid (see Figure 9) for planning:

1. "Planning a CLIL unit starts with content selection. The specific needs of the content subject are at the heart of every CLIL lesson and the starting point for material construction.
2. Providing multimodal input and distributing it evenly across the new CLIL unit produces highly differentiated materials which accommodate different learning styles and activate various language skills. Multimodal input also facilitates the development of new literacies.
3. The nature of the selected input (i.e. texts, charts, maps, video clips, etc.) and the students' familiarity with it determines how much and what kind of scaffolding is needed. It also indicates which subject specific study skills need to be practised with the students, so they can successfully cope with that input.
4. Tasks need to be designed to trigger both higher order thinking skills and lead to authentic communication/interaction in different interactive formats (solo work, pair work, group work).
5. The nature of the desired output (poster, interview, presentation, map, etc.) determines how much and what kind of output-scaffolding is necessary" (Meyer 2013, p. 308-309).

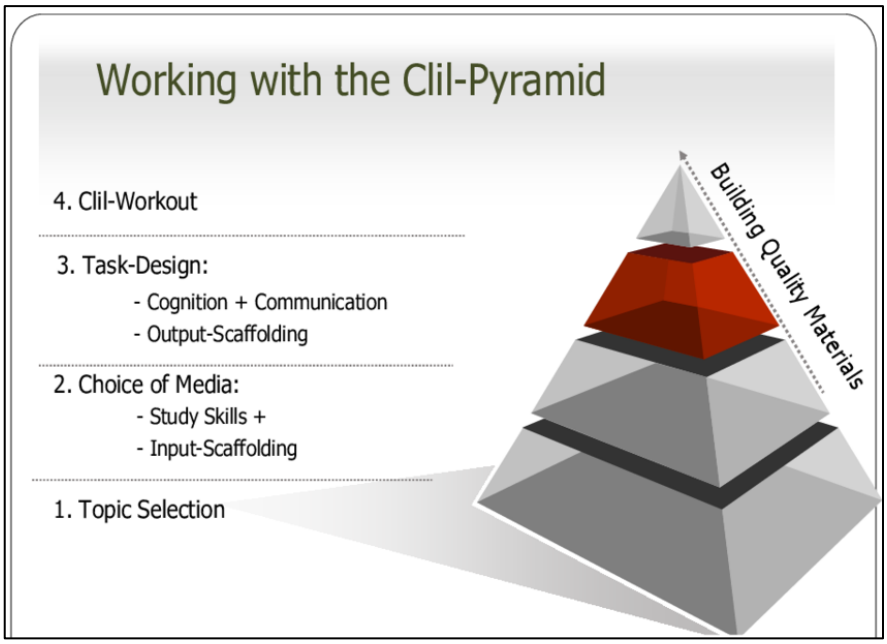


Figure 9: The CLIL Pyramid (Meyer 2010, p. 24)

DeGraaff, Koopman & Westhof (2007) created and tested CLIL teaching performance indicators. In his observation tool, he identifies five basic assumptions related to effective CLIL teaching based on second-language acquisition (SLA) penta-pie (see Figure 10).

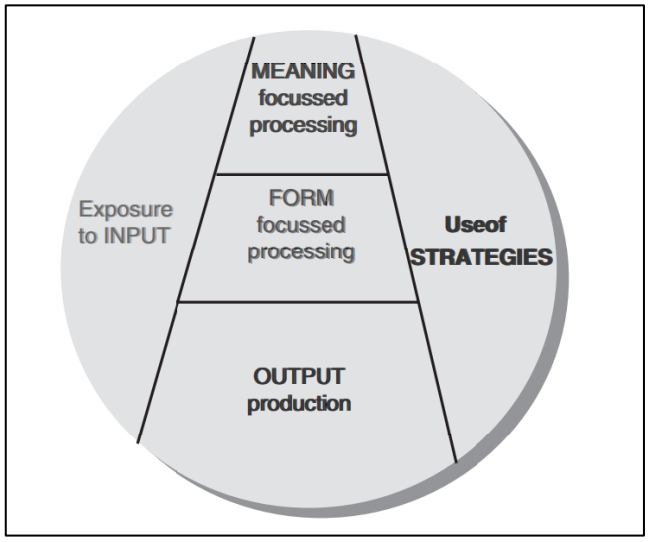


Figure 10: The SLA 'penta-pie' (deGraaf, 2007, p. 610)

From deGraaff's framework, we present only the aspects that relate to CLIL lesson-planning; we excluded the section that deals with unplanned scaffolding and reflection.

1) Exposure to input at a (minimally) challenging level:
    a) text selection in advance,

b) text adaptation in advance: list of core concepts, synonyms and/or translations of 'difficult' words, clarify text structure, use pictures, diagrams, summarise the text…,
c) adaptation of teacher-talk in advance (to prevent misunderstanding: simple sentence structures, giving synonyms, descriptions, translations of difficult words, etc.)

2) meaning-focussed processing
   a) stimulating meaning identification (filling in plans, using organisers or matching exercises),
   b) exercises on correct and relevant identifications of meaning (match pictures with the concepts, make a web-diagram, write the difficult words of the lesson…,)
3) form-focussed processing (awareness-raising of language form)
   a) providing examples of correct and relevant language forms
      explaining problematic and relevant language forms, e.g. by giving rules,
   b) peer feedback,
4) opportunities for output production:
   a) asking for interaction,
   b) letting students communicate,
   c) organising written practice (deGraaff et al., 2007, p. 607-610, shortened).

3.2 Daily lesson planning

In this section, we narrow the focus down to more specific daily lesson planning guidelines for CLIL and relevant to CLIL, illustrating their relevance to our context. Since we embrace Coyle's theoretical 4C framework as the cornerstone of CLIL, we open this section with Coyle's planning tools.

Coyle (2005, p. 7) presents a 3As tool for detailed lesson planning: the three A's stand for different stages of planning: Stage 1: Analyse, Stage 2: Add, and Stage 3: Apply/Assure. Coyle argues that Stage 2 is crucial for CLIL to be effective.

1. ANALYSE the language of learning: content analysis, identifying key words, phrases, grammatical functions.
2. ADD the language for learning, focus on the learner: metacognitive or learner strategies, classroom talk, discussion, task demands, scaffolding.

3. APPLY/ASSURE: the language which emerges through the learning context is built on to assure that there is cognitive and cultural capital for the learners to progress: task types and learning activities, thinking skills and high-level questioning, cultural awareness.

Coyle further presents a model lesson plan to illustrate the lesson-planning guidelines for CLIL: Part 1 includes information about the global goal, topic, level, aims, criteria for assessment, teaching objectives, and learning outcomes, while Part 2 contains bulleted activities, instruments for assessment, scaffolding tips, resources, and additional notes. The structure of the lesson is contained in the set of activities (Coyle et al. 2010, p. 82):

- Warm up: Let's think (PowerPoint). General overview of the unit.
- Previous knowledge: Starting a KWL chart[5]. Learners see and listen to different features of animals.
- Game: In order to check their comprehension, learners play a challenging game called 'I bet it's true!'
- Ending the lesson: Learners think about animals that might live in dry/cool places.
- Glossary: Time to think about new words that learners do not know. One of the learners writes down (on a poster) which words they decided to choose.

She proposes a CLIL unit checklist for the teacher to consider, including:

- global goals, teaching games and learning outcomes,
- content,
- language/communication, the three levels of language,
- cognition/thinking,
- culture,
- activities,
- supporting learning: practical activities, scaffolding, revisions
- assessment + feedback,
- reflection: variety, time management, adaptations, collecting students' feedback. (Coyle et al., 2010, p. 84-85).

[5] A chart featuring three columns: what I KNOW, what I WANT to know, what I LEARNT that the learners fill in in the course of the lesson/activity. It is a technique used in constructivists approaches. Developed by Ogle (1986).

Cambridge ESOL published a "Teaching Maths through English – a CLIL approach" book, accompanying the CLIL module of TKT Course (cf. Bentley 2010). They created a list of consideration for planning a CLIL lesson:

1. Activating prior knowledge,
2. Wait time,
3. Interactive pair or group work tasks,
4. Cognitive challenge + Providing scaffolding,
5. Developing thinking skills,
6. Learning outcomes and objectives,
7. Subject content,
8. Communication,
9. Thinking and learning skills (to support learners in developing learning skills such as observing details, taking notes, editing work, summarising and planning),
10. Tasks,
11. Language support (language of input + the language of output),
12. Materials and resources,
13. Cross-curricular links,
14. Assessment (link the assessment to the learning outcomes of the lessons).

In Catalunya, CLIL is a widely adopted approach supported by the Catalan Department of Education (cf. Navés & Muñoz 1999; Navés, 2009). Generalitat de Catalunya (2012) summarizes guidelines for a CLIL lesson plan for teachers within its educational system. They suggest that the first page should identify the learning outcomes, a list of different types of activities, resources, language learning, thinking verbs in Bloom's taxonomy, and assessment. The second page should be dedicated to Procedures – the activities are described. The Generalitat (2012) states that "the common denominators when planning lessons are:

1. Content
2. Teaching aims
3. Learning outcomes:
    i) learners should know...
    ii) learners should be able to...
    iii) learners should be aware...

4. Assessment: in relation to above (3) (can the learners…?)
5. Communication
   i) vocabulary: revisited/activated – new
   ii) structures
   iii) functions
6. in relation with above (5): examples of communication (interaction/task)
7. Cognition (cognitive skills) and examples
8. Resources (materials (sources), activities)
9. procedure: sequence of stages and steps"

They also list a set of reasons for planning a CLIL lesson, among which they incorporate the guidelines for planning, namely:

- "to meet the students' needs and cater for different styles,
- to control the time,
- to assess students' performances,
- to set targets,
- to structure your lesson: lead-in, task, revision,
- to plan for scaffolding,
- to support the LOTS and HOTS,
- to incorporate different methods and resources." (ibid.)

Meyer (2010) specifies the levels of his pyramid used for both planning a CLIL unit and designing CLIL materials (see Figure 9 for visualization).

- "The first level is topic or content selection: focus on needs, aims and outcome,
- Second level: study skills and input-scaffolding,
- Third level: task design: develop higher order thinking skills and trigger communication and cooperation among students,
- The top of the pyramid: final product (poster, presentation, debate…) determines output-scaffolding is necessary." (Meyer, 2010, p. 24)

To support unit planning using his CLIL Pyramid, Meyer developed a lesson planning template, see Figure 11 for a sample lesson on Japan. It identifies the following features: topic, media, language skills, and higher order thinking skills. Unfortunately, Meyer does not provide any details about the intended lesson (apart from the template).

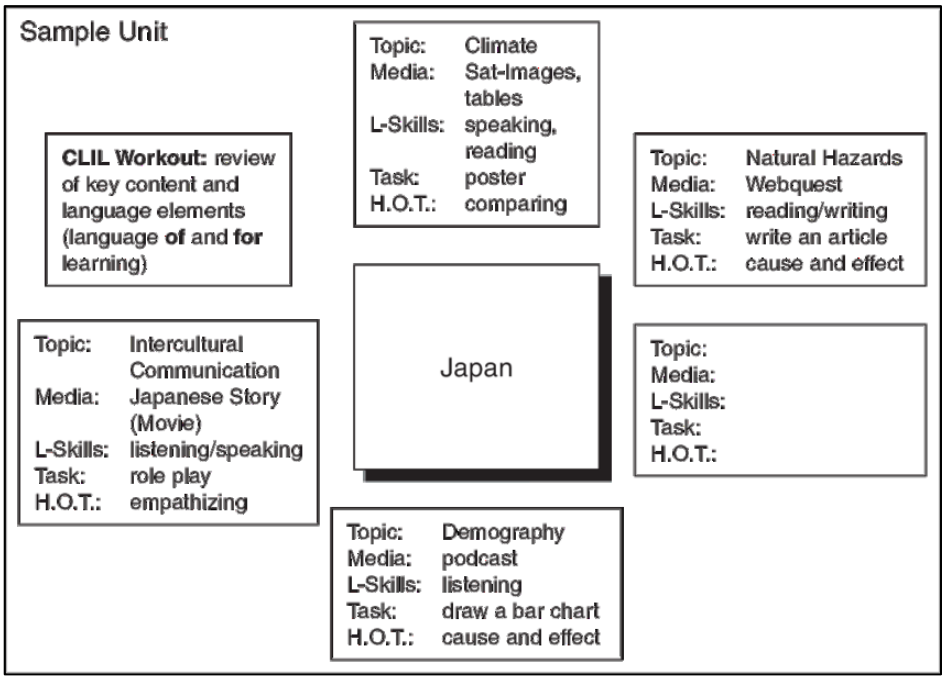


Figure 11: Sample Unit constructed using the CLIL Pyramid (Meyer, 2013, p. 309)

SIOP, Sheltered Instruction Observation Protocol (Echevarria, Vogt and Short, 2012), was originally devised as an observation tool, and has developed into SIOP Model for effective content instruction for students whose mother tongue is not English. In the SIOP Model, students are learning content material at their grade level while they receive instructional support to deal with the language demands of the content lesson. The model includes eight major components; we shall briefly outline their contents as well.

1. Preparation: the teacher is to formulate the content objectives, plan meaningful activities to meet the objectives, and select language objectives for each lesson,
2. Building background: connect the students' background and past experiences with the new learning,
3. Comprehensible input: using vocabulary that the students understand, demonstrating, guiding practice,
4. Strategies: support higher-level thinking, scaffolding strategies, graphic organizers,
5. Interaction: opportunities to interact with peers through flexible grouping,
6. Practice and application: hands-on material and manipulatives,
7. Lesson delivery: students are engaged in the lesson 90% to 100% of the time,
8. Review and assessment: formative assessment, reflective practice.

We maintain that sheltered instruction as described through the SIOP Model corresponds to CLIL to a large extent; we see the main difference in the overall goal of the programmes: in case of SIOP, it is to ease the integration of language minorities into standard classes, and in CLIL, it is to enrich and enhance foreign language learning.

3.3 CLIL materials

A daily lesson plan, which is the focal point of our research, is a type of a didactic material – primarily a teaching material, frequently including (or accompanied by) a learning material as well (e.g. a worksheet). We dedicate this section to the theoretical background and research on CLIL materials and their analysis. Since there is virtually no research on CLIL daily lesson plans outside teacher-training context, we shall also present relevant research frameworks and tools that were not designed directly for CLIL but share significant part of conceptual underpinning nonetheless.

While the research on materials design has largely focused on professional material creators so far, Canniveng and Martinez (2003) suggest a shift towards teacher-created materials. Our research follows this trend. Tomlinson (2011, p. 128) laments that materials evaluation, adaptation and production are often neglected or under-emphasised in teacher training courses, still he is a vigorous advocate of materials creation: "A 'home-produced' course-book, if it is well produced, stands a much greater chance of success locally simply because the authors are more aware of the needs of learners in that context, and are able to design the materials in such a way as to fit in with their own learning and teaching traditions, and with the conceptual world of the learners. (...) This implies a learning-centred approach to materials writing." Even if Tomlinson speaks of textbooks in the context of English language teaching, we hold that this is even more valid in CLIL contexts and no less relevant in lesson plans that are ultimately teacher produced.

Internationally, practitioners and academics deplore the scarcity of quality CLIL materials (cf. Eurydice, 2006; Coonan, 2005, p. 628; Mehisto et al., 2008, p. 22; Stohler, 2004, p. 267; Sudhoff, 2010, p. 34, Deller & Price, 2012, Meyer, 2010, p. 18, Wolff, 2007). In the Czech context, a nation-wide survey on CLIL implementation and its obstacles (Kubů et al., 2012) placed the lack of materials among the most pressing issues; these findings are seconded by Váňová et al. (2012), Hofmannová & Novotná (2007),

Slezáková (2010, p. 47) and by Šulista (2013) in his ample research on CLIL implementation among Mathematics teachers.

The publishing market seems to have been answering to a growing demand on CLIL; ESL textbooks publishers have included "CLIL sections", there are "CLIL readers" and even "CLIL textbooks". At the same time, related research often voices sharp criticism of CLIL-labelled textbooks, authors agree that more often than not is "CLIL" used as a marketing buzzword without actually respecting CLIL methodology. Researchers focus on different aspects of CLIL: Meyer (2010, p. 20) is convinced that in published CLIL materials "the cultural dimension has not been properly exploited yet"; Martín del Pozo and Rascón Estébanez (2015) investigated 25 textbooks by different publishers promoted as CLIL, and found an alarming insufficiency of linguistic objectives, thus failing the linguistic aspect of CLIL. Banegas (2014) looked into the CLIL sections of four series of ESL textbooks by four different international publishers and identified a variety of deficiencies, especially in terms of content adequacy and cognitive appeal to the intended target group. Banegas (2014, p. 357) goes as far as claiming that this may lead to "creating confusion among practitioners and school administrators and undermining CLIL's intended benefits in the classroom."

Moore & Lorenzo (2007) summarize the three basic options from CLIL teachers have when it comes to materials, each one of them with its advantages and disadvantages:

a. produce their own original materials from scratch;
b. employ 'undiluted' authentic materials;
c. adapt authentic materials in line with their teaching goals.

Numerous authors (cf. Czura, Papaja & Urbaniak, 2009, Dalton Puffer, 2008, Novotná & Moraová, 2003, Mäkiranta, 2014) expose the pitfalls of different approaches to materials in CLIL, arguing that both adaptation and production require skills that CLIL teachers might not have. Substantial hurdles in terms of materials creation are also reported by Infante, Benvenuto, & Lastrucci (2009) in Italy and Alonso, Grisaleña & Campo (2008) and Pena Díaz & Porto Requejo (2008) in Spain.

Morton (2013) found that among 52 CLIL practitioners, nearly 50% of the teachers were adapting authentic non-textbook materials and 90% claimed to create their own materials.

Among the reasons the teachers gave for such a high ratio of originally created materials were appropriateness of language and content for learners, appropriateness for educational and cultural context, flexibility, design and pedagogic approach, and availability and convenience. Morton emphasizes that CLIL materials should:

- "avoid underestimating learners linguistically and cognitively, by, for example, not treating linguistically low-level learners as cognitively low-level learners,
- include listening and reading activities that are not used to teach language features but are content meaning focused,
- avoid the use of bland, safe and harmonious texts by engaging students affectively and intellectually with stimulating texts relating to aspects of content,
- involve learners in activities in which they cognitively engage with conceptual content, thus enabling them to use the full resources of the brain." (Morton, 2013, p. 120-121).

Mehisto (2012) intends to identify the specifics of quality CLIL materials. He holds that "ideally, all learning materials are meant to

- support students and teachers, not restrict them,
- foster the creation of relational links between intended learning, students' lives, the community, and various school subjects,
- help students understand how learning is and can be applied in and outside of school,
- seek to build intrinsic motivation to problem-solve and learn,
- progressively develop students' content knowledge and language skills so that they are able to comprehend, conceptualise, systematise, appreciate and contemplate facts and experiences, and so that they are able to effectively communicate their own understandings and opinions through speech and writing,
- help students to build learning skills,
- promote critical and creative thought, discussion and learner autonomy,
- promote mutual understanding in social situations in order to contribute to joint problem-solving
- help students to understand their role, promote students' sense of belonging and engagement." (Mehisto 2012, p 16-17, shortened, bulleting added).

Taking the above-mentioned features of quality materials for granted, in other words, shared with quality non-CLIL learning materials, Mehisto (2012, p. 17) observes – though in a prescriptive rather than descriptive sense – that "quality CLIL materials are highly integrative and multi-layered and they help increase the likelihood that both content and language learning will be meaningful.". He provides ten fundamental criteria for "quality CLIL materials", detailing each of them and providing specific examples, as well as rationale and theoretical background. According to Mehisto (2012, p. 16-17), quality CLIL materials should:

1. "make the learning intentions (language, content, learning skills) and process visible to students,
2. systematically foster academic language proficiency,
3. foster learning skills development and learner autonomy,
4. include self, peer and other types of formative assessment,
5. help create a safe learning environment,
6. foster cooperative learning,
7. seek ways of incorporating authentic language and authentic language use,
8. foster critical thinking,
9. foster cognitive fluency through scaffolding of a) content, b) language, c) learning skills development
10. help to make learning meaningful."

Mehisto also mentions technical, environmental and social issues that materials need to respect, and even rules that pictures and illustrations in quality CLIL materials should adhere to. Mehisto also advocates reflective teacher's practice and suggests a set of features that need to be thought about in material design, such as sequencing, pacing, difficulty, responding to individual differences etc. We hold that while the criteria aim at materials, they are applicable to lesson planning as well.

Steiert & Massler (in Ioannou-Georgiou & Pavlou, 2011, p. 103-110) formulate a set of criteria for developing and/or evaluating and adapting CLIL teaching materials:

- Aims/learning outcomes for content and language (specified both in the area of subject content and in the area of language skills),

- Target language and mother tongue (ratio English/MT),
- Language teaching principles/techniques: pre-teaching, repetition and recycling of key words, additional support is provided wherever necessary (language frames, etc.),
- Visual support (comprehensibility, clarity, layout),
- Content subject teaching principles/techniques: topics appropriate for the learners' level of competence, encourage pair or group work, rely on students' experiences, relevant for the students, build up and promote subject-specific and/or global study skills...,
- Differentiation: different levels, learning styles and learning interests supported,
- Intercultural learning: possibility to encourage and/or extend intercultural learning with selected topics.

3.4 Materials analysis/evaluation

In the previous section, we elaborated on CLIL planning and materials design. In this section, we present different endeavours in the analysis and evaluation of (not only) CLIL materials and lesson plans.

Coyle et al (2010, p. 43-44) propose to use the modified Cummins' matrix (cf. Cummins, 1984) to audit CLIL tasks. They categorize tasks by their cognitive demands and linguistic demands, see Figure 12.

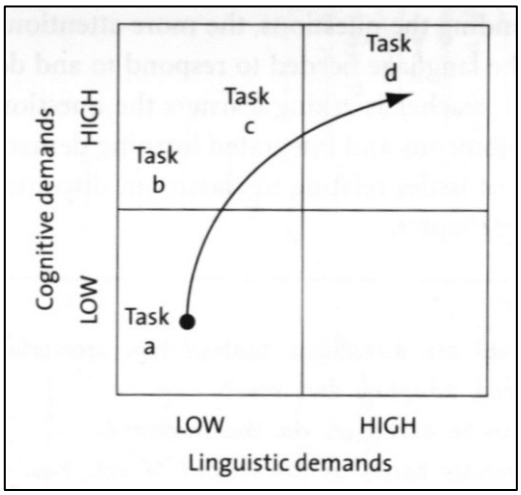


Figure 12: Auditing the demands of CLIL tasks, recommended sequence (Coyle et al., 2010, p. 43)

Coyle explains an ideal sequence of tasks in a CLIL lesson: “Task (a) was aimed at instilling confidence in the learners by starting with familiar work as a point of reference. Task (b) used recycled language, but this task made cognitive demands on the learners by introducing abstract concepts whilst using visuals to scaffold the new knowledge. Task (c) continued to develop new knowledge, but this time the language demands involved extending familiar language into more complex structures required to carry out the activity. The final task (d) incorporated new language and new content where the learners were engaged in cooperative group work supported by technological and teacher mediation.”

Cruces Rodriguez (2015) analysed primary CLIL textbooks published in Spain. She designed a rubric consisting of 28 items evaluated on a 5-point scale. The sections of the rubric are structured along Coyle’s 4Cs: 9 items are about content, 7 about Cognition, 6 about Communication and 6 about Culture. We present a shortened version, omitting items that are irrelevant to daily lesson plans.

1. contents agree with those prescribed by the current educational law,
2. challenging learners’ thinking, while accessible for the students’ cognitive level,
3. integrating language development and content acquisition,
4. including multimodal input,
5. opportunities for students to build on prior knowledge,
6. production of observable outcomes,
7. cognitively demanding for the target student
8. cognitive progression in content and activities,
9. opportunities for students to reflect on their own learning process,
10. study strategies,
11. HOTS and LOTS,
12. sufficient and appropriate scaffolding,
13. entirely correct language,
14. highlighting the core vocabulary items and phrases,
15. providing the corresponding language support,
16. different groupings,
17. promoting intercultural awareness,
18. balanced references to the students’ culture and others.

Lopez Medina (2016, p. 172-173) proposes a tentative 53-items-strong checklist for CLIL textbooks based on Mehisto (2012). She claims that most characteristics "refer mostly or totally to the content taught through L2" (Lopez Medina 2016, p. 167) and includes an independent item 53: "It is consistent with the principles of CLIL" (ibid. p. 173). She structures the items of her checklist along the 4C framework, adding a "General" section and splitting Communication into "Communication" and "Language". As with Cruces Rodriguez's work, we present a shortened version of the rubric, omitting items that we find impossible to identify in a daily lesson plan.

- The objectives are specified explicitly
- It includes self-evaluation
- It provides summarizing items at the end
- It shows quality in editing and publishing
- It contains appropriate pictures, diagrams, tables …
- Learning outcomes for learning are specified
- The content is appropriate for the students' age
- The content is relevant to students' experiences
- The order of sequences is flexible
- It provides support to simplify content (scaffolding)
- The activities are cognitively appropriate for the content
- It caters for the needs of different learning styles
- Activities activate previous knowledge
- Activities are challenging and motivating
- It provides support to simplify language (scaffolding)
- Activities are developed to encourage teacher-student and student-student communication
- It relates content to the learners' culture and environment
- It guides students in developing cultural awareness
- It gives guidance in the presentation of vocabulary
- It gives practice in guided composition in early stages

Panasuk and Todd created a rubric for the analysis of lesson plans based on their Four Stages of Lesson Planning (FSLP) strategy for planning a Mathematics lesson (cf. Panasuk, Stone & Todd, 2002). The four stages are as follows:

1. Objectives,
2. Homework (the authors perceive homework as a form of formative assessment which means that planning for homework means identifying how to make sure whether the objectives were met),
3. Developmental Activities (meaning: decomposing the big concept, identifying the subconcepts),
4. Mental Mathematics (task analysis).

The authors emphasize that "the introduced sequence is suggested for planning and not for delivering of a lesson. The delivery of a lesson progresses from objectives to mental mathematics activities, to the developmental activities, and to the announcement and explanation of the homework assignment." (Panasuk et al., 2002, p. 13).

The rubric aiming at analysing lesson plans created based on this lesson-planning framework is called Lesson Plan Evaluation Rubric (LPER) and features 17 items for which the authors specify levels of fulfilment. Todd lists the items and the formulation used to describe the highest observable standard for each of them:

- Objectives
- Homework linked to objectives & worked out
- Mental math, Teacher problems and Student problems worked out
- Student grouping
- Mental math criteria
- Phases of the lesson, Logical flow of the phases & Embedded Assessment
- Time guides
- Aligned to state Math Curriculum Standards
- Multiple representations
- Special need adaptations
- Student misconceptions
- No mathematics errors (Todd, 2005, p. 24).

Nováková (2013, 2014) investigates Mathematics teachers' lesson plans through the theory of didactic situations (cf. Brousseau 1997). She observes the following features:

- Topic of the lesson
- Objectives
- Structure and timeline
- Individual activities/tasks
- Organization (individual/pair/group work)
- Materials and equipment for both teacher and students
- Previous knowledge
- Learners' attitude and reactions
- Possible problems, obstacles and errors
- Correct strategies to solve the tasks
- Incorrect strategies that learners might employ

Apart from the specific features that Nováková's framework shares with CLIL principles (such as dealing with learners' previous knowledge, formulating objectives…), we would like to point out a similarity on a more general level: both approaches are convincingly learner-oriented and openly advocate the relevance of attitude in learning mathematics.

The Protocol for Language Arts Teaching Observation (PLATO) is a classroom observation protocol designed to capture features of L2 instruction. Grossman et al. (2014, 2015) built PLATO around 4 primary underlying constructs:

- Instructional scaffolding,
- Disciplinary and cognitive demand of activities and classroom discourse,
- Teachers' representation and use of content,
- Teachers' management of time and behaviour.

Mahan, Brevik & Ødegaard (2018) employed the PLATO rubric to analyse video-recordings with the objective to characterize CLIL teaching in science and mathematics, using the second language teaching as a baseline. The current version of PLATO (cf. Stanford university, 2013) features 13 items and also focuses on the content of instruction and activity structures for each 15-minute segment, and we include it in our overview of CLIL-compatible observation tools.

Blömeke, Paine & Houang (2008) measure effective teacher education, focusing on professional competence of teachers. Their research design employed 13 criteria to use in evaluating a lesson plan:

- lesson goals,
- teaching methods,
- teaching materials,
- the sequencing of the lesson,
- motivational strategies,
- student involvement, consideration of diverse needs,
- support of student cognition,
- mathematics content,
- assessment procedures,
- class climate,
- feasibility,
- other.

Blömeke et al. also looked into the use of certain technical terms when interviewing the teachers about lesson plans and their creation, namely lesson preparation, preconditions, learning objectives, affective/motivational goals, teaching methods, and assessment.

3.5 Universal Criteria

Tomlinson (2018, p. 59) states that to create the universal criteria for evaluation of materials, it is necessary to start from a set of pedagogical beliefs. Embracing this philosophy, this section describes our identification of the universal criteria across the wide continuum of CLIL.

Taking the principles of Coyle's elaborated frameworks (4C + 3A + language triptych) as a starting point, we compared all of the above-described models, tools and lists to identify items relevant to and objectively observable in CLIL lesson plans. We assigned a dichotomous quality to explicit mentions of the principles in the materials listed both in sections 3.1 through 3.4, without considering the weight attributed to the principles in any of the given sources (cf. Ragin, 1987). Table 1 presents an overview of the materials analysed and the features explicit in those sources.

Table 1: LPAT Development – Items featured in literature, ordered by number of occurrence

ITEM/AUTHOR	Coyle	Montalto	SIOP	Meyer	Lopez	Cataluny	TKT	Cruces	Steiert	LPER	deGraaf	Blömeke	Novákov	PLATO
INTERACTION	X	X	X	X	X	X	X	X	X	X	X		X	X
AIMS	X	X	X	X	X	X	X	X	X	X		X	X	
SCAFF. INPUT	X	X	X	X	X	X	X	X	X		X			X
PRIOR KNOW.	X	X	X	X	X		X	X	X	X			X	X
HOTS	X	X	X	X	X	X	X	X				X		X
SCAFF. OUT.	X	X		X	X	X	X	X	X		X			X
LANGUAGE	X	X		X	X	X	X	X	X		X			X
MULTIMODAL			X	X			X	X	X	X	X	X		X
STRUCTURE	X			X	X	X				X		X	X	X
ASSESSMENT			X			X	X			X		X		X
SPECIAL			X						X	X	X	X		X
REVIEW	X				X	X		X			X			
LEVEL			X		X			X	X	X				
CULTURE	X				X			X	X					X
REFLECTION			X			X		X		X			X	
LEARNING	X								X			X		X
CORRECT								X		X				
WORKED OUT										X			X	

Table 1 lists the individual principles identified in the resources, ordered by frequency of occurrence. Table 2 ranks the principles identified in the resources and gives the percentage of resources that featured them.

Table 2: LPAT development – CLIL principles, listed by occurrence

PRINCIPLE	%
pairwork and/or group work is encouraged	92.86%
aims for content area and L2 are explicitly stated	85.71%
input is scaffolded (simplified texts, pictures, charts, hands-on experience...)	78.57%
prior knowledge is activated	78.57%
higher order thinking skills are fostered	71.43%
output is scaffolded (non-verbal answers, fill-in exercises, sentence frames, modelled answers...)	71.43%
there is explicit focus on language demands, key words/phrases (vocabulary list, glossary) are identified	71.43%
multiple intelligences and learning styles are catered for, input is multimodal	64.29%
the lesson is clearly structured, timing for the individual parts is suggested	42.86%
assessment suggestions are included	42.86%
special needs students are taken into account	42.86%
key points of the lesson are reviewed	35.71%
L2 level and content level correspond to relevant standards	35.71%
culturally relevant to the intended audience, bias and stereotypes avoided	35.71%
reflective practice: possibly problematic areas are identified	35.71%
learning skills (planning, collaborating, note-taking...) are developed	28.57%
no mistakes	14.29%
the key tasks are worked out	14.29%

On average, each item appeared in 52.4% of the models analysed. A histogram (with outlier percentile of 10%) presented in Figure 13 clearly shows a significant gap around the average. Eight characteristics were featured in more than 62% of the resources. On

the contrary, none of the remaining 10 was identified in more than 43% of the resources analysed.

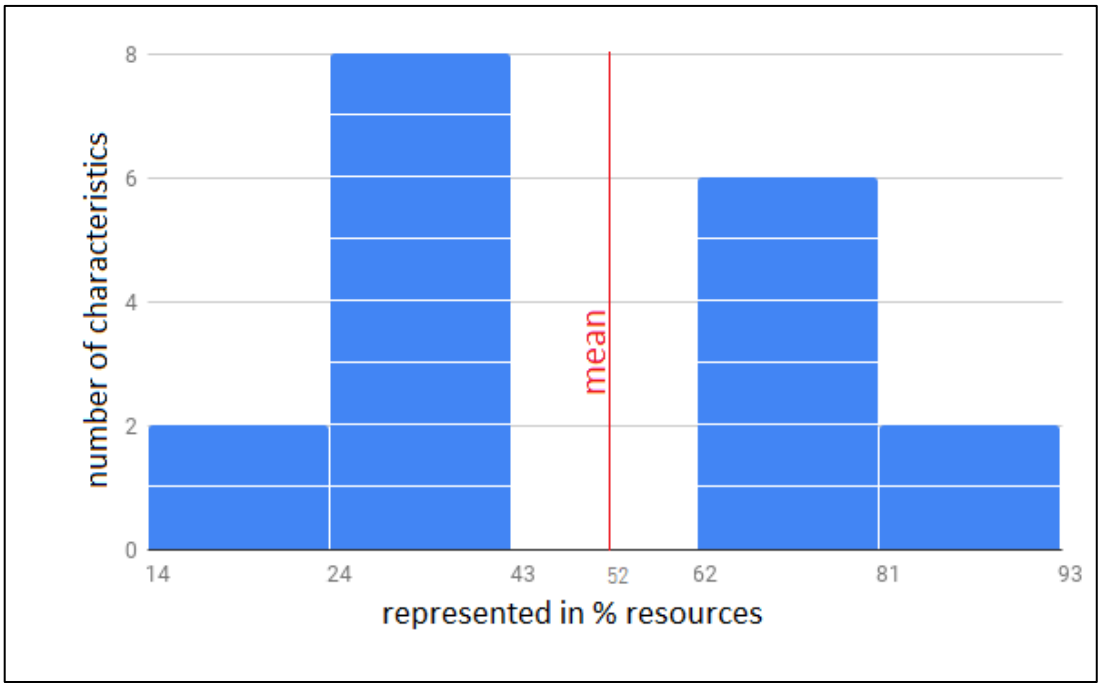


Figure 13: LPAT development – Number of characteristics in the resources (histogram)

Based on the frequency of occurrence of the individual features, we present our concept of a quality CLIL lesson plan. We name "Key" the 8 features of a lesson plan that we identified in more than 60% of the sources, and we hold them crucial for the lesson plan to comply with quality CLIL planning principles. In other words, these eight features constitute the CLIL lesson plan model, that will serve as a point of reference in our study. Under the heading of "Useful" we include the remaining 10 items: they boost the quality and usability of a CLIL lesson plan, especially in the context of mathematics.

Key features (CLIL lesson plan model):

K1: Interaction is encouraged, particularly through pairwork and/or group work,
K2: aims are explicitly stated (for content area and L2),
K3: input is scaffolded (simplified texts, pictures, charts, hands-on experience...),
K4: output is scaffolded (non-verbal answers, fill-in exercises, sentence starters, modelled answers, sentence frames…),
K5: higher order thinking skills are fostered,
K6: prior knowledge is activated,

K7: attention to linguistic demands, key words and phrases are identified (vocabulary list, glossary),

K8: multiple intelligences and learning styles are catered for, input is multimodal.

Useful features:

U1: The lesson is clearly structured, timing for the individual parts is suggested,

U2: L2 level and content level correspond to relevant standards,

U3: key points of the lesson are reviewed,

U4: assessment suggestions are included,

U5: reflective practice: possibly problematic areas are identified,

U6: culturally relevant to the intended audience, bias and stereotypes avoided,

U7: special needs students are taken into account,

U8: the materials contain no mistakes,

U9: learning skills (planning, collaborating, note-taking...) are developed,

U10: the key tasks are worked out.

3.6 Local Criteria

The procedure described in the preceding section allowed us to develop the universal criteria; to develop the local criteria (cf. Tomlinson, 2018: 59) we ran a survey among CLIL teachers and CLIL teacher trainees consisting of a single open question: "What do you expect in a CLIL lesson plan?"

In two consecutive academic years (2012/2013 and 2013/2014), a total of thirty-nine students of a blended CLIL course at the Department of Mathematics and Didactics of Mathematics, Faculty of Education, Charles University in Prague (see Novotná & Tejkalová, 2010 for details on the course design), provided answers to this question in pen and paper. The survey was administered mid-semester, after the respondents had been introduced to CLIL and its methodology, had seen sample lessons, and had discussed some authentic CLIL lesson plans. To this data, we added 19 e-mail responses to the same question received from graduates of Faculty of Education who had enrolled in the faculty CLIL courses in the previous years (either at the Department of English Language and Literature or at the Department of Mathematics and Didactics of Mathematics).

The answer was formulated in Czech; the responses were in Czech (and in one case, in Slovak). We did not prescribe the minimum or maximum extent of the answer, nor did we limit the time for answering. The students had been informed that their answers would not influence their final assessment in the CLIL course.

In total, we analysed 56 answers (we excluded two "I don't know" answers). We adopted a qualitative content analysis approach, interpreting the texts through structuration (Klapko, 2013). The responses were reduced to minimal segments carrying meaning about lesson plans and grouped by meaning to form a category. For each response, it was considered whether it was already matching an already formulated feature/quality or whether it constituted an item of its own; if necessary, the existing category was renamed to paraphrase all meaningful segments that it included. Altogether, we identified 16 categories. Eleven of them were features discernible in a lesson plan, the remaining five were evaluative (we refer to them as "qualities" of a lesson plan). On average, 95% of the respondents mentioned at least one specific feature of the lesson plans, and 45 % described at least one desired quality of a lesson plan, see Table 3 for details.

Table 3: LPAT development: Local criteria and their frequency

Charted as	FEATURE	%	Charted as	QUALITY	%
L1&L2	all L2 tasks translated to L1	65.85%	EDIT	editable	26.83%
WRKSHT	worksheet for the students	46.34%	ERROR	no mistakes	19.51%
VOCAB	translation vocabulary	41.46%	ALL_L2	all in L2	12.20%
TIME	timeline of the lesson	34.15%	COPY	"copy and go"	9.76%
SOLVED	solutions to the tasks	34.15%	NEAT	nice layout	4.88%
PHRASE	phrases for the teacher (instructions, questions etc.).	31.71%			
AIMS	objectives	29.27%			
PPT	presentation	26.83%			
PRRQST	prerequisites	17.07%			
INSTR	instructions for the teacher	17.07%			
STRUCT	structure	4.88%			

Figure 14 shows an overview of all items identified in the questionnaires.

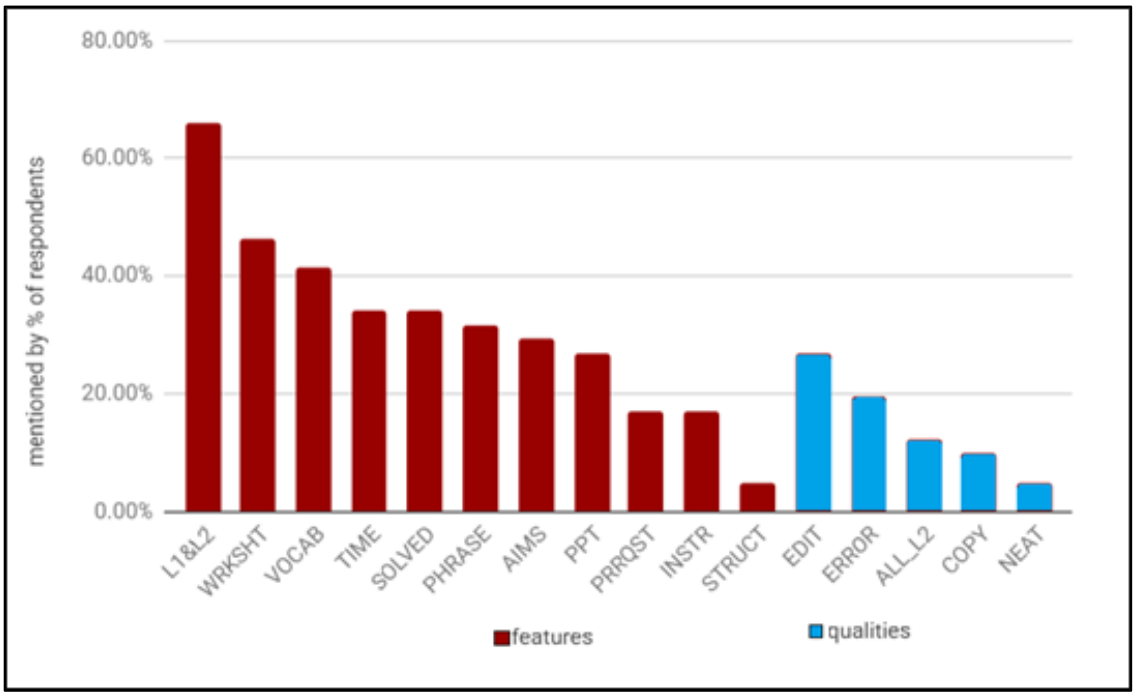


Figure 14: LPAT development – data from questionnaire

In 62% of the responses, there was an (unrequested) explanation. These explanations typically mentioned aspects of time/work-saving (e.g. "ideally I would not have to do anything but print it and give it to them"), voiced fear of usability (e.g. "I hope there are no mistakes," "I think it will not be applicable to my class"), expressed the need of adaptation (e.g. "I'd prefer a Word over a pdf, I always adapt other's materials anyway.") and admitted a limited mastery of L2 (e.g., "I am not so confident in English so I would appreciate only a small part of the lesson in English", "I do not think my learners have sufficient level of English to do Math in English.")

Mapping questionnaire results onto Universal criteria

We compared the results with the items of our Universal Criteria. Altogether, we were able to match four of the identified local features to the previously established universal criteria, seeing them as one of the possible manifestations of the criterion.

Table 4: LPAT development – matching Local criteria to Universal

item from survey	universal criterion
translation vocabulary	K7: attention to linguistic demands
structure	U1: lesson is clearly structured
aims, objectives	K2: objectives are explicitly stated
no mistakes	U8: materials contain no mistakes

Three more items from the survey partially corresponded to some of the universal criteria: we hold that the requirement for formulating the prerequisites is subordinate to activating prior knowledge (K6, awareness being the first step of activating prior knowledge) but decided to include the prerequisites as a local category for finer analysis. The same approach was adopted in case of Timeline: while in our universal criteria it falls into the universal category of U1: structuring and timing the lesson, we decided to create a separate category "timeline", modifying the universal requirement, too. Thirdly, a solution to a task is, in our understanding, a part of a "worked out" task; however, as with the previous items, we decided to carry on the Solutions category for a fine-tuned analysis. We further hold that the requirement for photocopiable material to use in classroom falls under the requirement for a worksheet and we joined them in one category. We decided to exclude "nice layout" from the tool on the grounds of it being too subjective. We opted to exclude the demand for "editability" since technology allows the users to convert to and from editable format instantaneously. We hold that the requirement for the whole lesson is connected to only one type of CLIL implementation and as such should not be included among generally identifiable categories.

Out of the 16 categories identified in the qualitative survey, four were mapped onto pre-existing Universal categories, three were excluded and two merged into one. In the end,

our qualitative survey rendered eight Local categories[6]. The order in which we include them is not representative of the weight or importance that we attribute to them.

C1: all L2 tasks are translated to L1

C2: worksheet

C3: timeline

C4: solution to the tasks

C5: phrases for the teachers

C6: presentation

C7: prerequisites

C8: instructions for the teacher

3.7 Lesson Plan Analysis Tool proposal

Altogether, we identified 26 criteria for the evaluation of a CLIL lesson plan: 18 universal criteria (8 "key" characteristics + further 10 "useful" items) and 8 local criteria. For the lesson plan analytic rubric, their manifestations in a lesson plan was particularized. We were aiming for items that were dichotomous and suited the qualitative approach to content analysis. Table 5 shows the original design of the Lesson Plan Analysis Tool (LPAT), featuring the criteria that were used as items of the questionnaire, and their corresponding manifestations observable in a lesson plan.

Table 5: LPAT Development: Proposed items of LPAT

code	questionnaire item	lesson plan feature
K1	interaction	pair work
		group work
K2	objectives	L2 & content objectives of the lesson
K3	scaffolded input	scaffolded input: visuals
		scaffolded input: charts
		scaffolded input: multimedia
		scaffolded input: manipulatives

[6] The code C was selected, to avoid confusion with L1/L2 abbreviations.

K4	scaffolded output	non-verbal responses
		sentence frames, sentence starters
		modelled output
K5	higher order thinking skills	L2 tasks trigger higher order thinking skills
K6	prior knowledge activated	prior knowledge of relevant L2 or content is activated
K7	attention to L2	vocabulary list, glossary
		purely language-oriented task
K8	multimodality	learners convert information from one mode of representation to another
U1	structure	structured in at least 3 discernible parts
U2	adequate level	adequate L2 level
		adequate content level
U3	final review	final review
U4	assessment	assessment
U5	reflective practice: possible problems identified	possible problems identified
U6	cultural dimension	avoids bias and stereotypes
		is relevant to Czech students
		fosters intercultural awareness
U7	special needs students	special needs students are catered for
U8	no mistakes	minor mistakes that do not complicate understanding
		major mistakes (complicate understanding)
U9	learning skills developed	learning skills developed
U10	tasks worked out	at least 1 task is worked out
C1	L2->L1 translation	L2 text are translated to L1
C2	worksheet	Worksheet, photocopiable material for learners
C3	timeline	the individual tasks/stages are timed
C4	solutions	correct solutions are provided
C5	phrases for the teacher	phrases for the teacher are included in the lesson plan (instructions, questions, feedback…)

C6	ready-made presentation	ready-made presentation
C7	prerequisites	Content and/or L2 prerequisites are formulated
C8	instructions for the teachers	lesson plan includes instructions for the teachers

In this section, the first design of the tool has been introduced. In the following chapter, we describe our piloting of both the questionnaire and the rubric, and further adaptations that the Lesson Plan Analysis Tool underwent.

4 Pilot study

In the previous sections, we explained the development of our universal and local criteria of the LPAT. In this section, we detail the questionnaire design and administration, and we describe the process of preliminary testing of our tool on a set of lesson plans. We conclude with adaptations to our research design that were made as a consequence.

4.1 Sample and administration of the pilot study

The respondents in our pilot study were the students and teachers who had provided answers to the survey used to develop the local criteria. In January 2014 they were all invited to the piloting by email or through an informal personal meeting, informing them that there would be two phases of the piloting: their lesson plans on CLIL financial mathematics would be analysed, and they would be expected to fill in an online self-administered questionnaire. The participants were encouraged to either provide a previously created CLIL lesson plan on financial mathematics/literacy, or to create one that would be analysed in the study and could be shared among the other participants. Knowing that the plans would be shared, the respondents were provided with real audience to which the lesson plans were intended, and at the same time were extrinsically motivated to join in the research by gaining access to further lesson plans. They were also promised detailed feedback on their lesson plans from the researcher. Out of the 56 people addressed, 35 agreed to participate in the piloting, that is, to fill in a questionnaire in February, and to provide a lesson plan by the end of March. February and March were selected to respect the rhythm of an academic year: firstly, not to overlap with the examination period at the University, and secondly, to avoid the concurrence with the teachers' workload connected to the mid-year evaluation at secondary schools.

In February 2014, we ran the self-administered online questionnaire. The respondents were invited to participate by an email with a direct link and had seven days to fill the form in, before the collection of data was terminated. The questionnaire was administered through Google Forms, by which anonymity was secured, and the data was saved in a cloud. The respondents could have selected any time for filling in the questionnaire, and the time spent over the questionnaire had not been limited nor measured, nor did we

record the order in which the respondents selected the individual items. The completion of all the pages of the questionnaire was required for the data to be included in our survey. Twenty-one questionnaires were completed within the deadline, twelve more were completed after an email prompt, and two people excused themselves from the participation in the piloting for personal reasons. Altogether, we collected questionnaire data from thirty-three respondents.

By the end of March 2014, thirteen students of the CLIL course at Department of Mathematics and Didactics of Mathematics agreed to their lesson plans (created as a final assignment in the course) being used for the pilot study, and five teachers provided us with their own lesson plans on Financial mathematics. Out of these eighteen lesson plans, twelve were created using a word-processing software, the rest were handwritten and digitized. The participants who had filled in the questionnaire but decided not to provide the lesson plan unequivocally mentioned lack of time as the primary reason for not holding to the previously promised extent of participation. The motivation, however, differed: in some cases, the participants mentioned that the plan they had created previously would require significant adaptations for them to feel comfortable sharing it (and such an adaptation would be far too time-consuming to undertake at the moment); in other cases, the respondents simply held that they could not/would not invest time in the creation of a lesson plan that they do not need directly for their teaching in near future.

While the prospect of the lesson plans being shared among colleagues provided context and motivation, it might have discouraged some of the participants. The negative implication of the audience effect[7] (cf. Zajonc, 1965) might have influenced the return rate of the lesson plans, together with the relative time demands of the two steps.

Figures 15 through 19 provide an overview of the sample of the piloting: We can see that most of the participants were Mathematics teachers or teacher trainees, six had a dual qualification (both for Mathematics and L2), and three of them were language teachers, see Figure 15. Possible other content-subject qualifications were not inquired.

[7] the fact that in some cases, the presence of an audience can lead to a better performance, while in other situations the effect might be quite the opposite (cf. Zajonc, 1965)

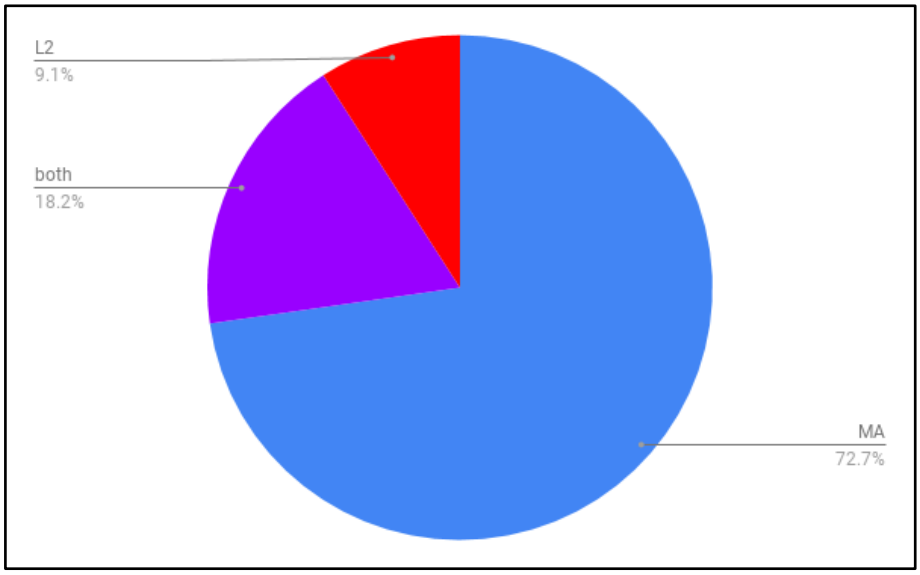


Figure 15: Pilot study – Teacher qualification

Figure 16 illustrates the ration of students to teachers in our pilot study. All of the respondents who had been the students of the CLIL course in 2012/2013 or 2013/2014 were labelled "students", other respondents as "teachers" independently of their current occupation.

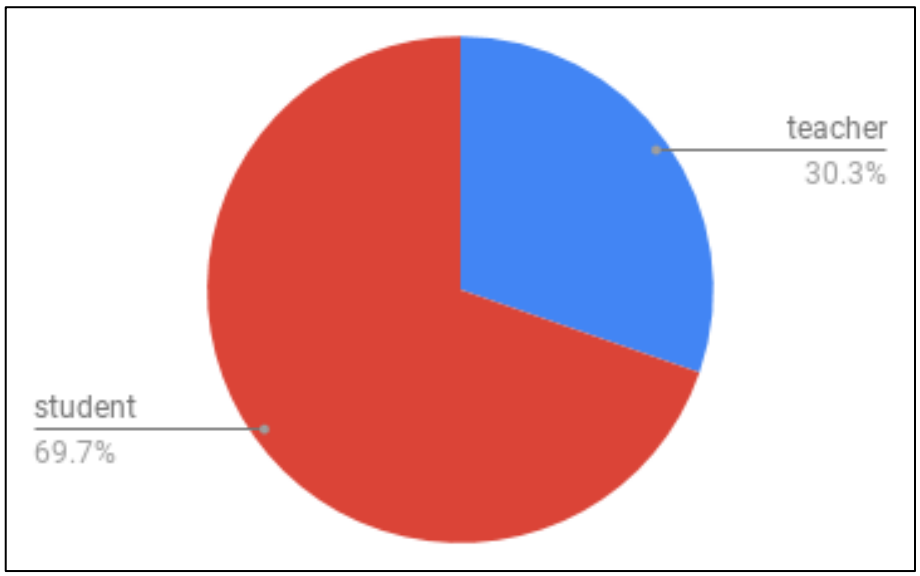


Figure 16: Pilot study sample – students vs. Teachers

Several of the students in our sample were actually teachers who were extending or their formal qualification. We inquired about the teaching practice of the participants; it was decided that the compulsory teaching practice that is a part of the teacher-qualification

curriculum does not account for teaching practice. Figure 17 thus illustrates the ratio of the participants who had at least one year of independent teaching practice to those who did not. The extent of this practice, however, was not inquired.

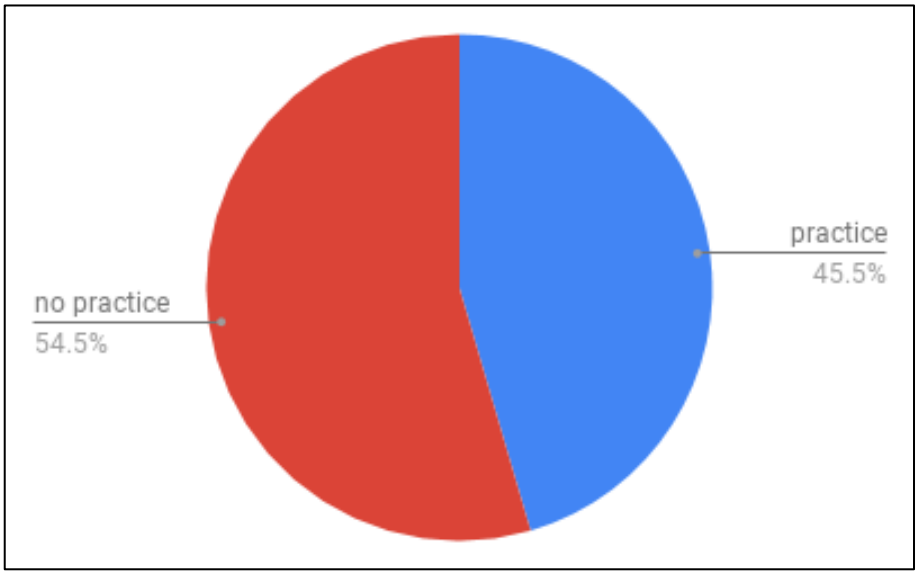


Figure 17: Pilot study sample – teaching practice

Figure 18 shows the gender distribution in our sample. There was almost a half of male participants in our pilot study – a ratio significantly higher than in the general population of Czech teachers (cf. Ministerstvo školství, 2017),

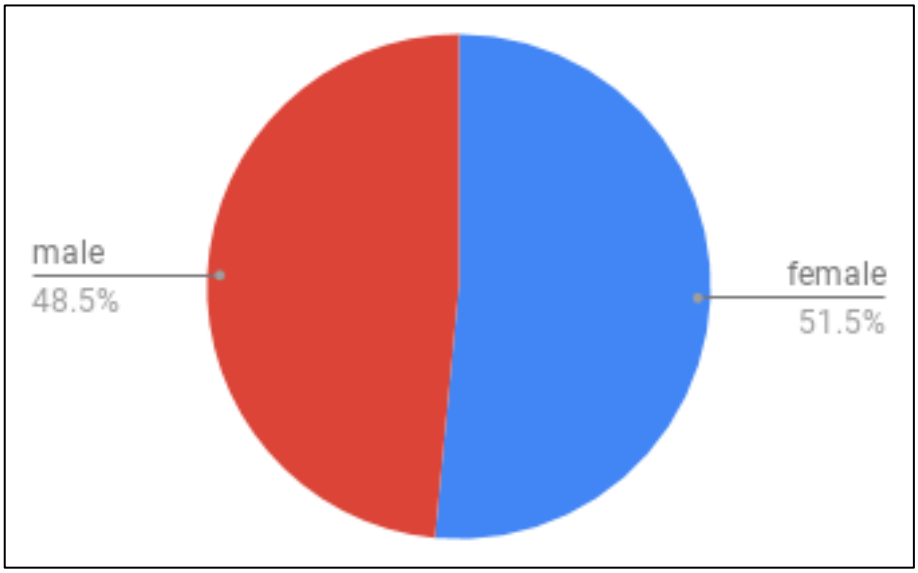


Figure 18: Pilot study sample – gender

Lastly, Figure 19 shows the language levels that the respondents reportedly had. The questionnaire featured a simplified definition of each of the CEFR levels of language

competence, and the participants were asked to assess their own level. We understand that such a self-assessment is bound to be subjective, and that L2 teachers were probably more familiar with the CEFR levels. However, to get more objective data, it would probably be necessary to administer a L2 test, and neither the intentions or the scope of our research required such investment.

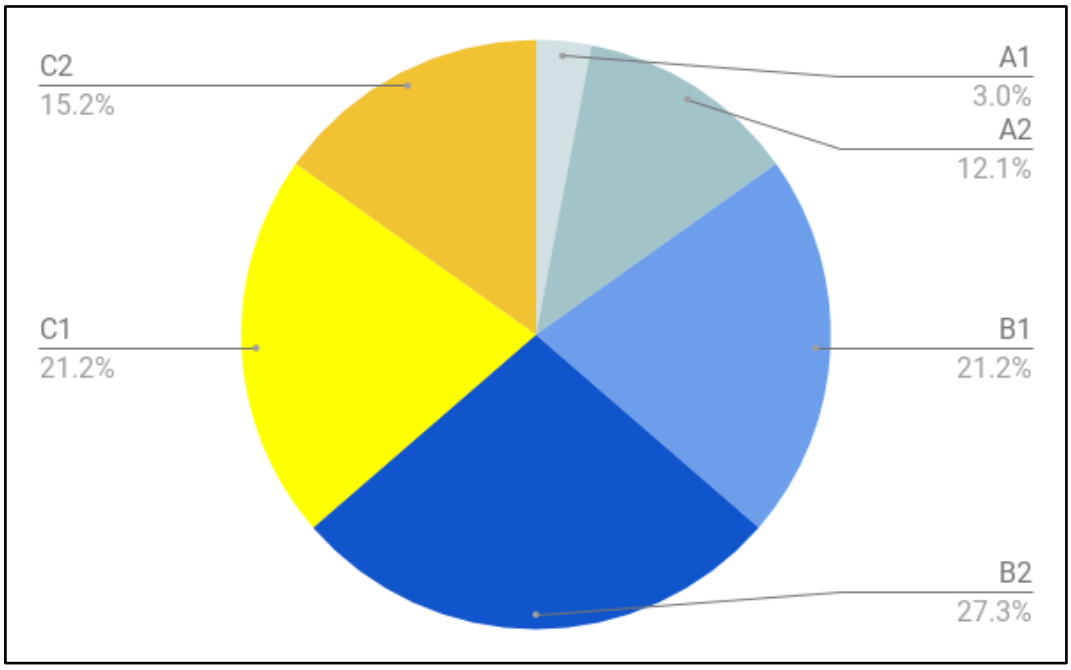


Figure 19: Pilot study sample – self-evaluated L2 competence based on CEFR levels

4.2 The questionnaire in the pilot study

In the questionnaire the respondents were prompted: "What are the features of a good CLIL lesson plan? Choose up to eight items." All of our respondents used full eight items; 36 % of them verbalized that they would have wanted to be allowed to select more items (and none explicitly stated that less descriptors would have sufficed).

We invited the participants to share any comments in a text field on the last page of the survey.

4.3 The lesson plans in the pilot study

We scrutinized the lesson plans for the previously established items of the LPAT (see Table 5: LPAT Development: Proposed items of LPAT on page 71 for the individual features), recording their frequency.

4.4 Piloting: Data & discussion

Table 6 shows the frequency of items in the questionnaires. The LPAT key criteria are highlighted. We can see that the respondents' "top eight" differs from the key criteria of the LPAT. Unlike the LPAT model of a CLIL lesson plan, the respondents focused on the adequacy of level and on the structure of the lesson plan. The option "Other" was used six times. In one case, there were only blank spaces left in the text field. It was possible to frame the remaining five of the open responses under the general requirement for connection to the Czech Framework Educational Programme (FEP) or its implementation at schools.

Table 6: Pilot study – overview of the questionnaire data, ordered by frequency

"What are the features of a good CLIL lesson plan?"			
Code	Item	count	%
K3	input scaffolding	21	63.64%
K7	attention to L2	21	63.64%
U2	adequate level	21	63.64%
U1	structure	19	57.58%
K2	objectives	18	54.55%
K4	output scaffolding	17	51.52%
C7	prerequisites	17	51.52%
K6	prior knowledge activated	15	45.45%
C8	instructions	13	39.39%
K1	interaction	12	36.36%
C3	timeline	12	36.36%
C2	worksheet	9	27.27%
C6	presentation	9	27.27%
U5	reflective	8	24.24%
U9	learning skills	8	24.24%
U10	worked out	8	24.24%

C5	phrases for teacher	8	24.24%
K8	multimodal	7	21.21%
U3	review	7	21.21%
C6	culture	7	21.21%
K5	HOTS	5	15.15%
C9	FEP	5	15.15%
U4	assessment	3	9.09%
U7	special needs	1	3.03%

Furthermore, in dire contrast to our model, HOTS were only selected as a feature of a CLIL lesson plan in 15% (5 out of 33) of the respondents, and multimodality in slightly over 21% (7 out of 33).

Figure 20 presents the frequency with which the individual Key criteria were selected in the questionnaires. With the average of 14.5, we notice a significant drop in K5: Higher Order Thinking Skills and K8: multimodality.

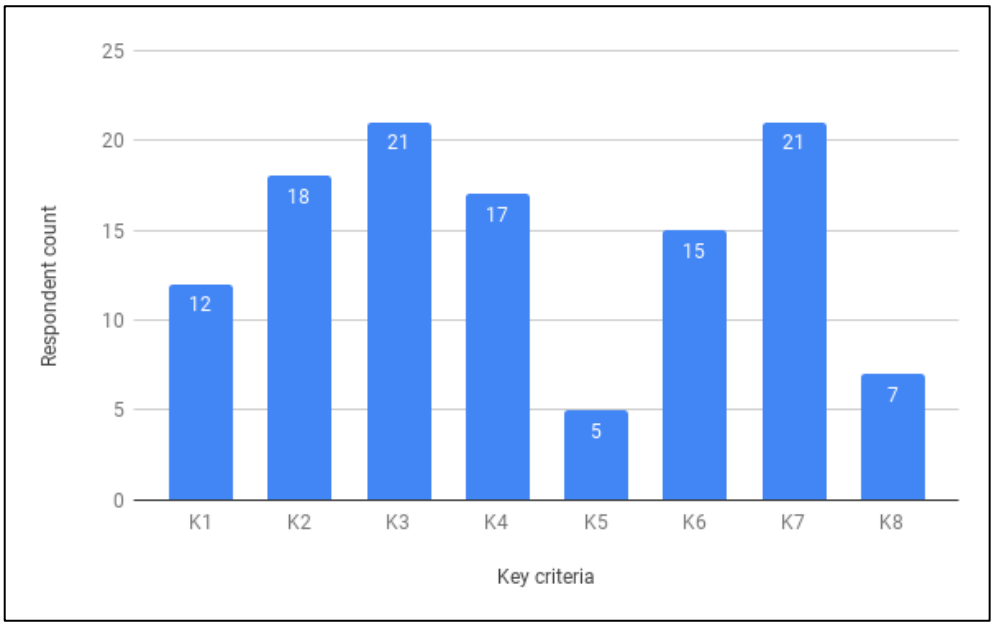


Figure 20: Pilot study questionnaires – Which Key criteria were the most frequently selected?

Looking only at the key criteria of LPAT, we can see that the overall questionnaire responses partially correspond to our model of a CLIL lesson plan. All of the key features were identified at least once, even if none of the questionnaires identified all eight of them.

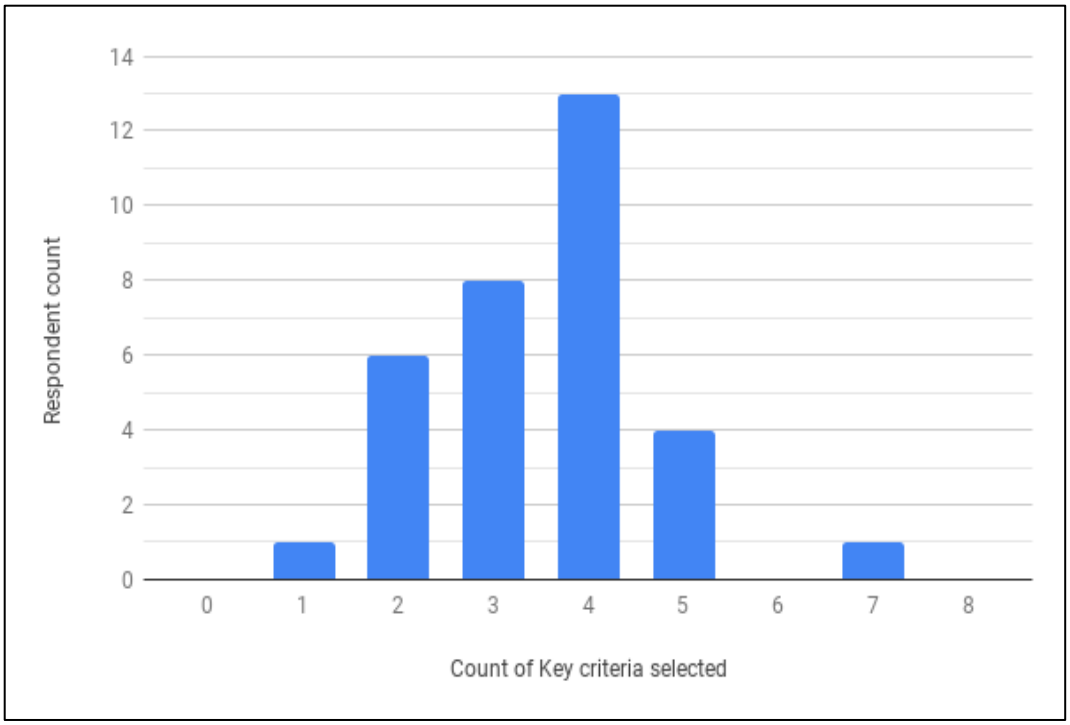


Figure 21: Pilot study questionnaires- How many Key criteria were selected?

Figure 21 shows how many of the key criteria were selected in the individual questionnaires. Most respondents identified four or less of the key criteria – the overall average was 3.5 criteria per respondent.

To wrap up the questionnaire discussion: while all our key criteria were represented in the responses at least once, none of the respondents identified all eight, and 97% of the respondents selected five or less of the LPAT key criteria.

We conjecture that the high frequency with which the evaluative item (adequate level) was selected might have been influenced by phrasing of the opening prompt: to identify features of a "good" CLIL lesson plan.

LPAT was used to analyse the lesson plans; in addition to that, the overall content topic of each lesson plan was identified. Five topics appeared in the lesson plans: taxes, interests, shopping, budgeting and currency conversion, with Interests being by far the most frequently selected topic (see Figure 22 for details on count).

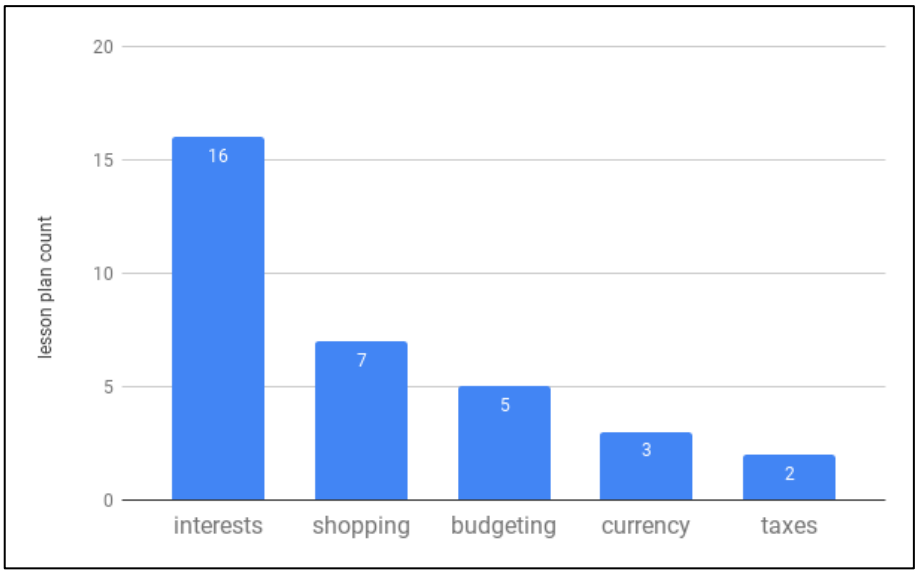


Figure 22: Pilot study lesson plans – topics

We focused on the extent in which the LPAT key criteria are manifested in the lesson plans. Figure 23 presents the overview. We decided to include two interpretations of the K2: Objectives category: by definition, the K2 criterion was met if and only if the two objectives (content and language) were specified; only 11% lesson plans complied. However, had we settled for one objective being formulated (independently on which one), we can observe that over 61% of the lesson plans would have met the requirement. Nonetheless, adhering to CLIL principles, the two objectives are required, which makes the objectives the least represented key criterion in the lesson plans.

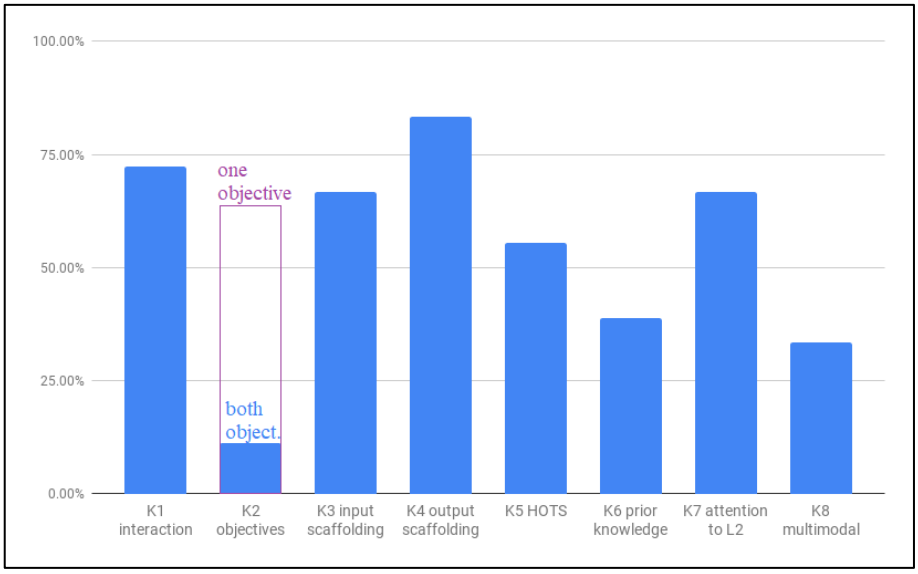


Figure 23: Pilot study lesson plans – How frequent are the Key criteria in the lesson plans?

Similarly to the situation in the questionnaires, none of the respondents' lesson plans met the Key criteria in full extent. On average, each lesson plan featured 4.3 of our Key criteria. Figure 24 shows how many of the lesson plans met 3, 4, 5, and 6 of the Key criteria, respectively (never did we identify no or only one key characteristic, nor more than six).

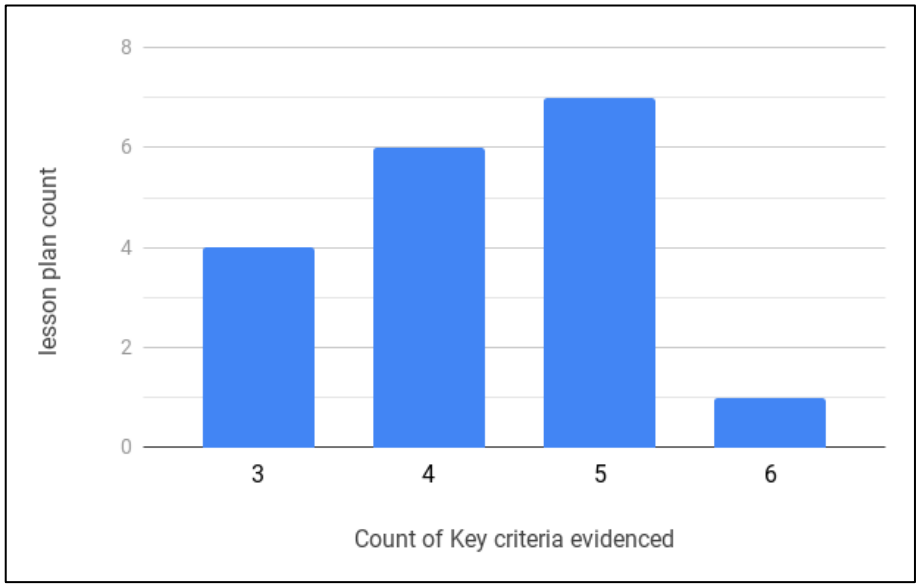


Figure 24: Pilot study lesson plans – How many Key criteria did the individual lesson plans feature?

Full data from the questionnaire were charted alongside the frequency of the items in the lesson plans, see Figure 25 (weighed against the size of each sample). The "C" category, that is, the items identified based on Czech teachers' and students' input, shows a stronger prevalence of lesson-plan-evidenced features over survey-identified features than the universal criteria, key or not key).

Presenting the same two datasets, Figure 26 offers a different perspective, ranking the differences between count of items in the questionnaires and in the lesson plans. We can see that more than any other criterion, the K2 (Objectives) was significantly more often identified in the questionnaires than actually featured in the lesson plans. However, we want to repeat that this discrepancy is true for the "strict" interpretation of the criterion, that is, when both content and L2 objectives are required.

The overall trend is that more features appeared in the lesson plans than were identified in the questionnaire (both in numbers and in variety). While the average questionnaire identified 3.5 of the LPAT key criteria, the lesson plans featured, on average, 4.3 of the eight criteria. It may be assumed that the respondents in our piloting were more likely to employ the CLIL principles than to identify them in the online survey.

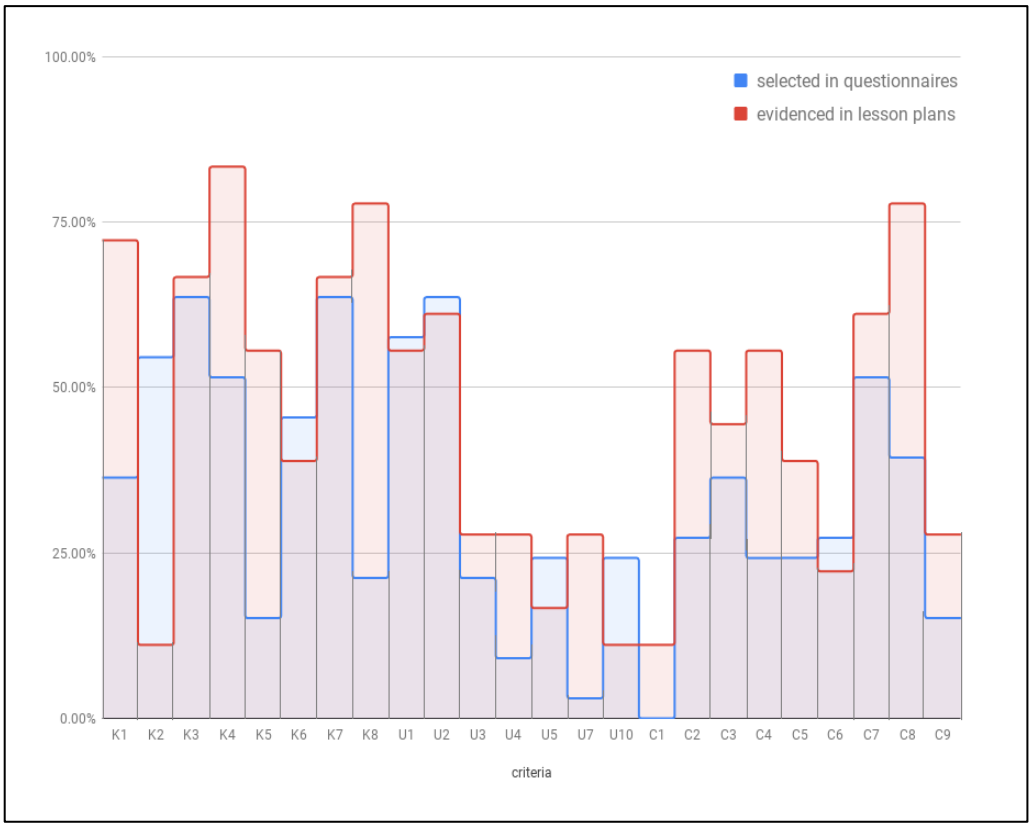


Figure 25: Pilot study – LPAT features in questionnaires vs. in lesson plans

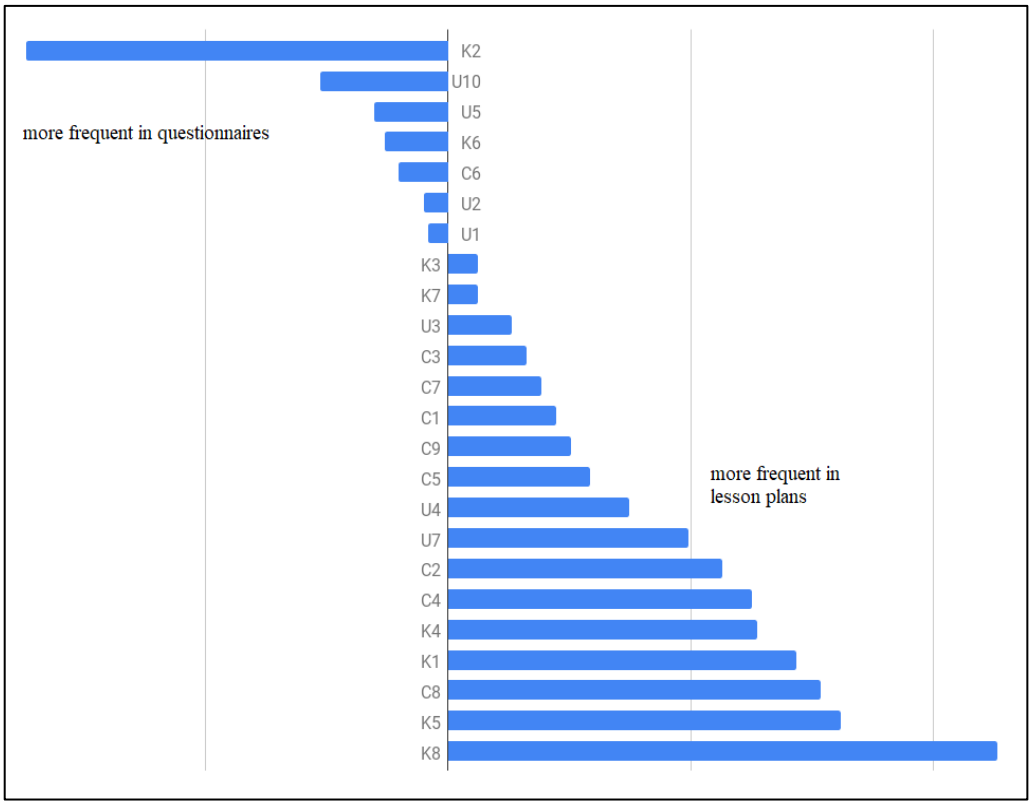


Figure 26: Pilot study – Which features appeared in the lesson plans more than in the questionnaires?

Among the criteria evidenced in the lesson plans with much more frequency than in the questionnaires, K8: Multimodality is the most salient. Notwithstanding, our understanding of evidence of multimodality in a lesson plan is fairly wide, and in many cases, it encompasses also features coded as scaffolding. It is possible that the respondents gave preference to scaffolding over multimodality in the questionnaire, even if they basically meant the same thing (e.g. the use of visuals, organizers, multimedia, drama etc.). Other features appearing with a higher frequency in the lesson plans than in the questionnaire were K5: Higher order thinking skills, C8: instructions for the teacher, K1: interaction (both pair work and group work were accounted for as evidence of interaction), K4: output scaffolding, and C4: solutions to the task. We want to highlight that items K8, K1 and K5, while low-ranking among the characteristics of a CLIL lesson plan presented through the questionnaires, were frequently included in the lesson plans. This suggests that the respondents of our pilot study might not have been able to select these key areas when prompted, nevertheless, they do employ them in their CLIL lesson planning.

4.5 Summary and implications of the pilot study

To conclude:

1. We were able to identify the extent to which the teachers' notion of key features of a CLIL lesson plan mirrors the LPAT key items. No further features were added by the participants; however, the reliability of the survey might have been influenced by possible triggering of an evaluative approach in the respondents by the formulation used in the questionnaire (What are the features of a *good* CLIL lesson plan?) and reinforced by including of evaluative features among descriptive ones in the LPAT (namely: adequacy).
2. We were able to identify the extent to which the respondents' lesson plans complied with the CLIL lesson plan model guided by the eight key criteria. However, our sample was smaller than in the survey part.
3. We were able to compare the frequency of the items selected in the questionnaires to the frequency of the features in the lesson plans; decisions had to be made about the interpretation of some of the features. Since the authors of the lesson plans were a subset of the anonymized survey respondents, we were not able to draw convincing conclusions about the sample in terms of data triangulation.

4. Due to the unbalanced nature of the sample in the piloting, we were not able to carry out a meaningful comparison of teachers based on their qualification.
5. Despite our (unannounced) presupposition, the lesson plans featured linguistic errors and content inadequacies.

Reflecting on our pilot study, we identified several impulses for our research design:

- LPAT needs to be adapted based on the reflection of the process coding and data evaluation (adaptations to individual features are detailed in the following section),
- the evaluative features should include the assessment of L2 and content adequacy and comprise an independent section of the LPAT,
- the instructions in the questionnaire need to avoid suggesting an evaluative approach,
- to be able to answer our fourth research question (comparison of L2 teachers to non-L2 teachers), our sample needs to be more balanced in terms of qualification than in the piloting study,
- sequential data collection (collection of lesson plans after the administration of the questionnaire) needs to be reconsidered to moderate the dropout of respondents between the questionnaire survey and the collection of lesson plans,
- the respondents should be allowed to decide by themselves whether they wanted to have their lesson plans shared.

5 LPAT used in the main study

It was decided to keep the multiple-choice nature of the questionnaire, excluding the evaluative characteristics from it, and to keep the number of choices at eight, as there were no major changes to the key universal criteria. The evaluative characteristics were moved to a separate section, not featured in the survey.

5.1 Overview of the LPAT adaptations

Some of the categories were restructured, embedded or excluded. Table 7 shows the changes in the LPAT. Changes and additions are in bold, whereas the items that were moved or removed are crossed out at their original positions.

Table 7: Adaptations to the LPAT

code	questionnaire item	lesson plan feature	commentary on changes
K1	interaction	pair work	
		group work	
K2	objectives for both content and language	L2 objectives	language and content objectives are to be recorded separately
		content objectives	
K3	scaffolded input	scaffolded input: pictures, illustrations	reformulated from "visuals"
		scaffolded input: charts	
		scaffolded input: multimedia	
		scaffolded input: manipulatives	
		scaffolded input: adapted text	feature added
K4	scaffolded output	non-verbal responses	
		sentence frames, sentence starters	
		modelled output	

K5	higher order thinking skills	higher order thinking skills	
K6	prior knowledge activated	prior knowledge activated	
		prerequisites formulated	feature added (originally C7)
K7	attention to L2	attention L2: vocabulary list	
		attention L2: purely language-oriented task	
		attention to L2: all L2 tasks translated to L1	feature added (originally C3)
K8	multimodality	multimodality	
U1	structure	structured in at least 3 discernible parts	
		final review	feature added (originally U3)
U2	~~L2 level, content level~~	~~adequate L2 level~~	moved to evaluative section
		~~adequate content level~~	
U3	final review	final review	
U4	assessment	assessment	
		homework	homework is viewed as an assessment tool
U5	reflecting on possible issues and special needs	possible problems are identified **and/or adaptations suggested**	description of the feature reformulated and extended
		alterations for special needs learners are suggested or worked out	special needs focus added
U6	cultural dimension	~~avoids bias and stereotypes~~	moved to evaluative section
		~~is relevant to Czech students~~	cancelled as irrelevant

		fosters intercultural awareness	
U7	~~special needs students are taken into account~~	~~special needs students are taken into account~~	incorporated in U5
U8	~~no mistakes~~	~~minor mistakes that do not complicate understanding~~	moved to evaluative section
		~~major mistakes (complicate or even prevent understanding)~~	
U9	~~learning skills developed~~	~~learning skills developed~~	deleted
U10	tasks worked out	at least 1 task worked out	
		solutions are given	feature added (originally C4)
C1	~~L2 tasks translated to L1~~	~~L2 tasks translated to L1~~	incorporated in K7
C2	worksheet	worksheet	
C3	timeline	timeline	
C4	~~solutions~~	~~solutions are given~~	incorporated in U10
C5	~~phrases for the teacher~~	~~phrases for the teacher~~	incorporated in C8
C6	ready-made presentation	ready-made presentation	
C7	prerequisites	prerequisites	
C8	instructions for the teachers	instructions for the teachers	
		phrases for the teacher: instructions	features added (originally C5) and refined
		phrases for the teacher: feedback	
C9	FEP	elements of Framework Educational Program	feature added
E1	Language	minor mistakes	

		major mistakes	language evaluation
		adequate L2 level	
		correct decimal separator	
E2	Content	corresponds to curriculum	content evaluation
		realistic	
		simple	
		advanced	
E3	Culture	avoids bias and stereotypes	culture evaluation
E4	Exposure	all lesson planned in L2	language exposure evaluation

After the piloting, the tool was restructured. In total, 20 characteristics of a CLIL lesson plan remained. These were elaborated in features of a lesson plan (with some features shifted within the tool, or excluded altogether), accompanied by ten markers of accuracy, adequacy, and exposure.

The following sections highlight and explain the changes in the items; wording of the pop-up text used in the questionnaire is given. Active voice was selected for the additional text, to complete a virtual beginning "A CLIL lesson plan on financial mathematics/literacy…"

5.2 Changes in the categories

This section lists the categories left in the LPAT, features the texts that were used in pop-up windows of the self-administered questionnaire, and in relevant cases explains the details of the changes or notes for coding.

K1 interaction

Pop-up text: "promotes interaction by employing pair work or group work"

K2 objectives for both content and language

Pop-up text: "states the objectives in both areas"

Language and content objectives are to be recorded separately – it was noticed that the lesson plans repeatedly featured only one of the objectives required by CLIL teaching principles.

K3 scaffolded input

Pop-up text: "helps learners understand the input (text and tasks) by using for example pictures, diagrams, repetition/rephrasing..."

The terms "pictures and illustrations" was employed instead of a more general notion of "visuals", to clearly differentiate this category from audio-visual materials included in the "multimedia" feature. An additional descriptor of input scaffolding was added: adapted text.

In the lesson plans, four types of input scaffolding will be distinguished:

- pictures & illustrations,
- graphic organizers: charts, mind maps, tables, flow charts and diagrams,
- multimedia: audio or video employed,
- manipulatives,
- adapted text.

K4 scaffolded output

Pop-up text: "helps learners participate and give answers by e.g. modelling the sentences, offering sentence starters, using matching exercises etc."

In the lesson plans, three types of output scaffolding will be distinguished:

- sentence frames, sentence starters, and fill-in exercises: in all three types, the learners are given parts of the sentences they are supposed to produce, and they fill in only the missing segment; fill-in exercises are usually intended to scaffold written output and frames and starters support oral production,
- non-verbal answers: may include total physical response (learners answer for example by standing up, perform the required non-linguistic action; in Mathematics, this form of output may include answering through showing the

correct numeric answer using fingers or a calculator, writing it in symbolic or iconic language), matching tasks, color-coding, multiple choice items,

- phrases for learners, modelled output.

K5 higher order thinking skills

Pop-up text: "includes also higher order thinking tasks (Bloom), such as analysing, organizing, evaluating, hypothesizing, creating, designing etc. "

K6 prior knowledge activated

Pop-up text: "activates and builds upon learners' prior knowledge"

By activation of prior knowledge, we understand an activity that

a) directly relates to the lesson
b) aims at learners' existing knowledge, preconceptions, (mis)understandings.

Typical activities of prior knowledge activation are brainstorming, linking the lesson to previous, using a KWL chart etc.

K7 attention to L2

Pop-up text: "language is adapted to meet the level of the learners, there are tasks aimed explicitly at language"

The originally local criterion, or rather a requirement for "all L2 tasks to be translated to L1" was added as one of the manifestations of the "Attention to L2": by including the two language modalities in the lesson plan the author allows the teacher (or the learner) a) to double-check the meaning, b) to employ L1 if necessary without the need of on-the-spot translation, and c) work with a bank of full phrases relevant to the lesson.

K8 multimodality

Pop-up text: "learners convert information from one mode of representation (e.g. text or picture) to another (e.g. map, chart, performance)"

In the lesson plans, the events will be recorded where learners a) actively convert information from one mode of representation to another or b) are offered input for one task in at least two different modes.

U1 structure

Pop-up text: “is clearly structured in at least three stages: introduction-main part-final part, timing is specified for the individual tasks or stages.”

U3 final review

Pop-up text: “contains a final activity that summarizes what was learned in the lesson, or that raises attention to a specific linguistic or content feature of the lesson”

In the lesson plans, the Review feature is to be analysed in connection to the Structure, as it is a specific aspect of the structure of the lesson plan.

U4 assessment

Pop-up text: “the assessment is built in the lesson plan; formative assessment is favoured”

In accordance with Panasuk et al. (2002), homework was perceived as a form of assessment, and was included among the features of a lesson plan as such.

U5 reflective practice

Pop-up text: “identifies/explains areas where learners might be struggling and/or offers adaptations; suggests alternatives for special needs learners.”

The description of the reflective nature of the lesson plans was refined to say, “reflecting on possible issues and special needs”. Some lesson plans limited themselves to the identification of a possible obstacle, often referring to either struggling learners or gifted learners, while others formulated adaptations without explicit allusion to a specific issue or target group.

U6 cultural dimension

Pop-up text: “promotes intercultural awareness”

The fact of being “culturally relevant to Czech students” was found to be a) subjective and evaluative, b) too vague, c) in the context of the Digital age, irrelevant. On the contrary, the requirement for the lesson plan to avoid any cultural bias constituted its own criterion in the evaluative section of the lesson plan.

U10 tasks worked out

Pop-up text: "contains solutions to the tasks, shows the work-out of more complicated problems"

The criterion of solutions being provided was deemed to be an aspect of worked-our problems.

C2 worksheet

Pop-up text: "features a photocopiable worksheet for the learners"

C6 ready-made presentation

Pop-up text: "features a ready-made presentation to use in classroom"

C7 prerequisites

Pop-up text: "states what the learners need to/should know in the content area and in L2 for this lesson"

We decided to keep the prerequisites as a separate category for the questionnaire survey. While we perceive the identification of the prerequisites as a first step to the activation of prior knowledge, we hold that by identifying prerequisites and not activating the learners' prior knowledge suggests a formal understanding of the notion rather than its embracing.

C8 instructions for the teachers

Pop-up text: "contains instructions for the teacher, guidelines how to work with the material"

This option was selected by students rather than by experienced teachers. We decided to keep the criterion in our LPAT to see if more experienced teachers would agree with the students.

C9 FEP

Pop-up text: "provides connections to the FEP, e.g. states cross-curricular links or specifies key competences)

15% of our respondents (5 people) voiced that a CLIL lesson plan should feature some of the requirements connected to Framework educational programme (resp. School

educational programme), naming “connection to key competences”, “identification of the cross-curricular links” and in one case “the stuff that we have to write in the classroom registers because of the FEP”). Since FEP-SEP framework is a significant specific of the Czech educational system, we decided to include this criterion in the LPAT.

5.3 Items deleted

Learning skills as an independent item were excluded from the LPAT completely. During the piloting, we were not capable of coming up with a concise, observable, unambiguous definition or rather specification for this criterion within our research design. Many of the aspects of learning skills are encompassed in Higher order thinking skills, Cooperation, Multimodality... Moreover, we argue that the mere manifestation of strategies and activities connected to the development of learning skills (such as using group work to promote collaborative skill or proposing a problem-solving task) in a lesson plan is not a satisfactory or convincing evidence of said skill being actually developed in the lesson. The identification or development of a framework for monitoring the evidence of the learning skills in a lesson plan is beyond the scope of the study presented, and since learning skills do not represent any of our Key criteria, the investigation of learning skills in CLIL lesson plans remains a suggestion for a possible future study.

5.4 E1 – E4: Evaluative section

The features concerning evaluation of the adequacy and accuracy of the language, content, culture or language exposure comprised their own characteristics: they were excluded from the questionnaire and left only in the rubric for the actual lesson plans. This meant that we would not be able to relate the evaluative criteria to the teachers’ opinions recorded in the questionnaires. Notwithstanding, without being scaled or otherwise detailed, the evaluative perspective of the respondents would be inevitably compromised by inter-individual differences: the subjectivity would hamper the validity of our data. For the evaluation of the features in the lesson plans, criteria were described, which mitigates the influence of a personal bias of the evaluator and allows us to look into this level of the lesson plans in terms of dichotomous items (to carry on the pattern set by the content analysis for the overall tool).

E1a, *minor L2 mistakes*: to be evaluated only in the L2 segments of the lesson plan, true if the material contains typos, spelling mistakes, punctuation, or grammar mistakes that do not complicate or impede understanding.

E1b, *major L2 mistakes*: to be evaluated only in the L2 segments of the lesson plan, true if the material contains (also) language mistakes that complicate or impede understanding, namely improper word choice, non-English syntax, choice of grammatical means that changes the meaning (incl. tenses).

E1c, *adequate L2 level*: true if the level of each L2 task is A2-B1 (A2 being the minimum required level at this stage of education), usually false for non-adapted non-scaffolded worksheets or other authentic materials

E1d, *correct decimal separator*: true if the decimal point (rather than a comma) is used in all of the L2 segments; understandably, a correct decimal separator is a feature on the border between language and content accuracy; we decided to join it with other language-connected errors.

E2a, *correspondence to curriculum*: true if the content relates to Hesová (2012) and Ministerstvo financí (2017) criteria for financial literacy for the final year of compulsory education

E2b, *realistic*: true if the prices, rates, taxes etc. in the L2 tasks are realistic, meaning that they correspond to the socio-cultural context given (e.g. prices in GBP imply different nominal values than prices of the same merchandize in CZK); the interest rates (deposits/loans), as well as the percentage of discount, are within realistic/believable rates. Despite our personal conviction, we decided, in accordance with the financial literacy standard (Ministerstvo financí, 2017), to neglect taxes in calculating deposit interests (in other words, for the purpose of this study, neglecting taxes is not considered a deficiency of the realisticity of the lesson plans).

E2c, *simple*: true if the majority of L2 tasks correspond to aspects of financial literacy standard (Ministerstvo financí, 2017) for lower levels of education. We do not intend to imply that the level is insufficient; we are only relating the lesson plans to an established framework.

E2d, *advanced*: true if the majority of L2 tasks correspond to aspects of financial literacy standard (Ministerstvo financí, 2017) for higher levels of education. We do not intend to imply that the level is too advanced for the intended learners; we are only relating the lesson plans to an established framework.

E3, *avoids bias and stereotypes*: true if the lesson plan does not feature content biased for or against any culture, gender, age, race, avoids stereotyping. Based on subjective views of the evaluator.

E4, *all lesson planned in L2*: true if there are no tasks or other sections intended to run exclusively in L1 (both directly, by specifying it the instructions for the teacher, or implicitly. This feature had been identified by some of our respondents in the qualitative survey during the development of the LPAT and is hereby reinstated, as it may provide insight in differences between lesson plans intended for different models of CLIL implementation.

6 Data and discussion

This chapter presents the findings of our study. First, the sample is described through the independent variables. Second, the data from the questionnaire is presented to answer research question 2; this subchapter is concluded by a tentative comparison of the questionnaire data with data from our piloting. Data from the lesson plan analysis follow, elaborating on research question 1 in detail. The two data sets are then compared in an investigation of research question 3. Finally, the results from comparing L2 teachers and those without official language-teaching qualification in both questionnaire responses and lesson plan features are presented, and research question 4 is covered.

Throughout the chapter, the data presented is related to previous research, and potential limitations are explained.

6.1 Sample details

We structure the overview of our sample based on the independent variables in three subsections: we include the teaching qualification and level of language under the heading of Qualification for CLIL, then Experience comprises age, years of teaching practice, and CLIL teaching practice. Finally, gender constitutes a category of its own.

Qualification for CLIL

There is a wide agreement that CLIL, depending on its focus, may be taught by a language teacher or a content teacher, ideally, by a dually-qualified teacher. The requirement for any CLIL teacher is a certain level of L2, even though there is no universal consensus on what the minimal or optimal level is.

Figure 27 shows the teaching qualifications of the respondents. Using a dichotomous item in the online questionnaire, we specifically inquired about L2 qualification and mathematics qualification. We did not inquire about the subjects that the respondents actually taught, which in retrospect might have brought a finer insight into the study. Possible second or other qualification apart from L2 and Mathematics was not inquired. A deeper analysis of the differences between the L2-qualified teachers and their non-L2 counterparts is presented in section 6.5.

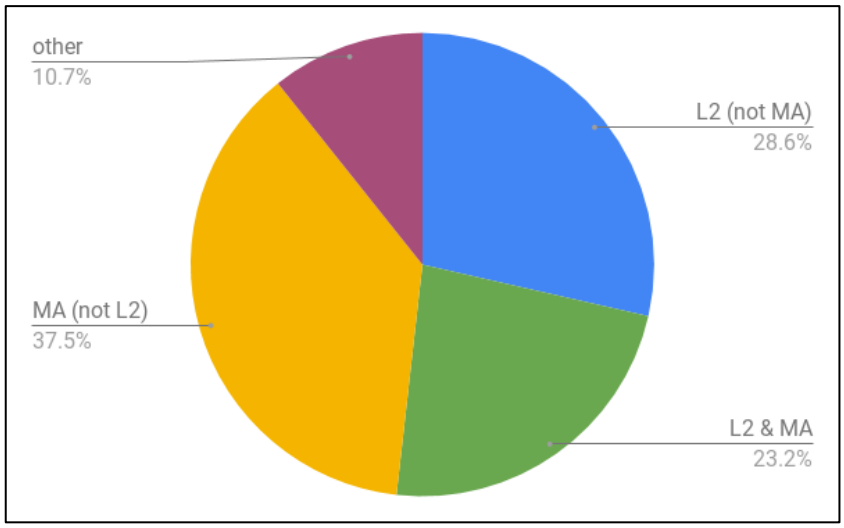


Figure 27: Teacher qualifications of our sample

Another independent variable we observed was the level of L2. We did not specify any particular L2, however, we suggested that the respondents gave the level of the language which they employed in the lesson plan. The respondents selected one of the CEFR levels; we provided them with a brief description of the individual levels (based on Ivanová, 2002). We are aware that the self-perceived level of the respondents might not represent the actual language level, however, a more precise evaluation of the respondents' language competence is outside the scope and aims of this study. Figure 28 shows the distribution of the self-evaluated L2 levels among the respondents.

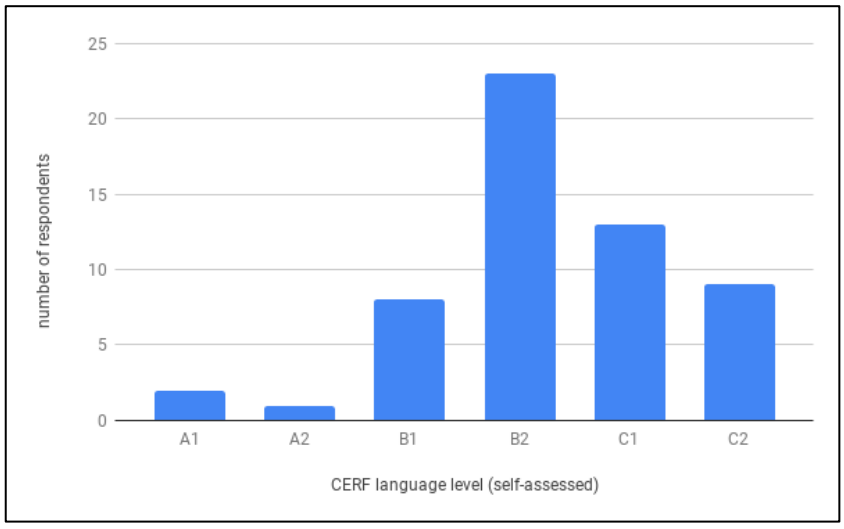


Figure 28:Sample – self-assessed L2 levels (by CEFR)

Experience

See charts in Figure 29 and Figure 30 for distribution of age and years of teaching practice. All our respondents had at least three years of teaching practice, most of them were between 31 and 40 years old.

A condition that might have distorted the data on years of teaching practice is the fact that we only asked the respondents to fill in a total number of years of teaching practice, not providing any guidelines as how to treat the item. This means that we did not account for the extent of practice over time (actual teaching hours), or the way the respondents treated possible interruptions in their teaching careers (due to maternity leaves, changes of employment etc.).

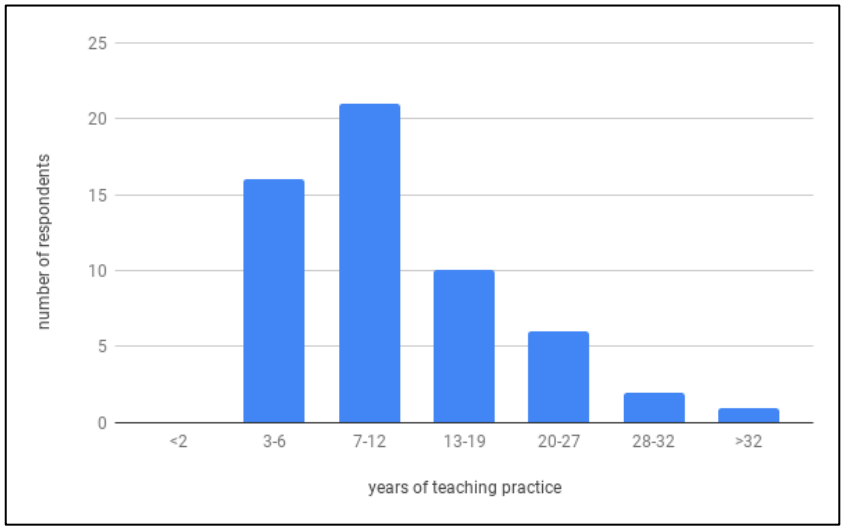


Figure 29: Sample – Years of teaching practice

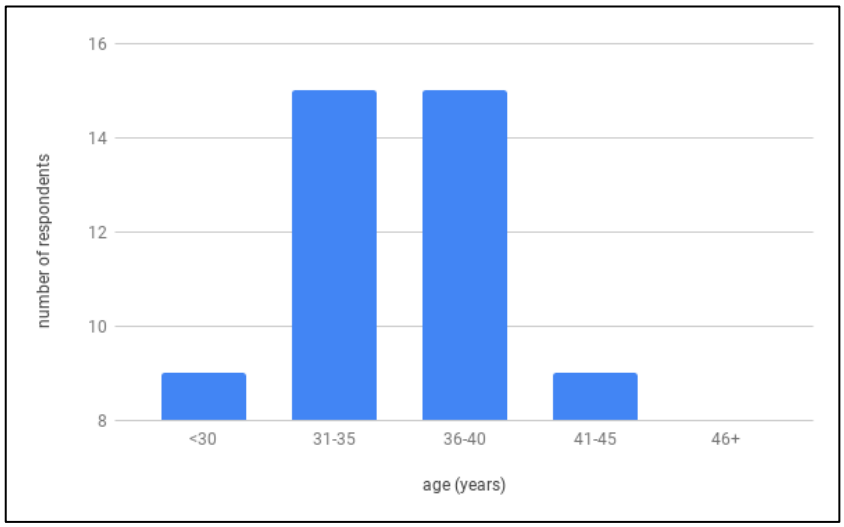


Figure 30: Sample – Age

We tested whether the years of experience correlated with the data we obtained through the LPAT, resp. with the number of Key characteristics that the respondents identified in the survey, and whether there was a correlation between years of experience and the number of Key characteristics featured in the lesson plans. For the survey, we found a very weak of negative correlation (r = -0.009) and for the lesson plans, only a very weak positive correlation (r = 0.189). It seems that year of teaching experience did not have any consistent impact on the overall data.

Finally, almost 70 % of our respondents claim to have some CLIL teaching practice (see Figure 31).

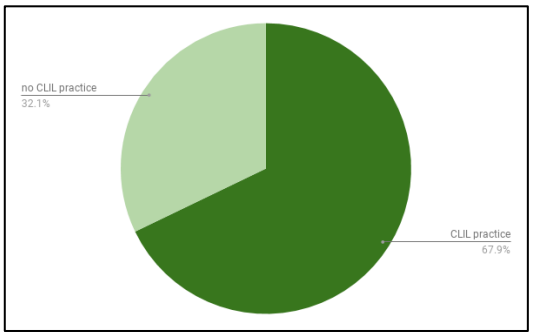


Figure 31: Sample – Do they have some CLIL teaching practice?

Compared to data on CLIL implementation in the Czech Republic (see Figure 32), there is more than double ratio of teachers who employ CLIL in our study compared to the general population. Nevertheless, all of our respondents underwent some form of CLIL training and were willing to submit a CLIL lesson plan – which in our opinion significantly raises the probability of them having actual teaching experience with CLIL.

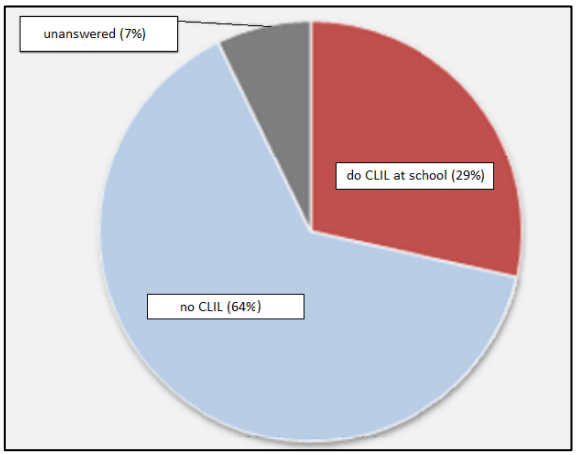


Figure 32: 2012 research of implementation of CLIL in the Czech Republic (NIDV, 2012, p. 16)

However, the percentage of CLIL-experienced respondents might be misleading due to our lack of information of the extent of CLIL teaching practice. We decided not to inquire about the extent because of the varieties of models in which CLIL can be – and is being – implemented. The instructions for the respondents would have had to be extremely complex to provide relevant data; for the sake of the time consumption, and so as not to discourage the respondents, we opted only for a dichotomous item.

Gender

Figure 33 shows the distribution of gender in our sample, with 21.4% male respondents to 78.6% of female respondents.

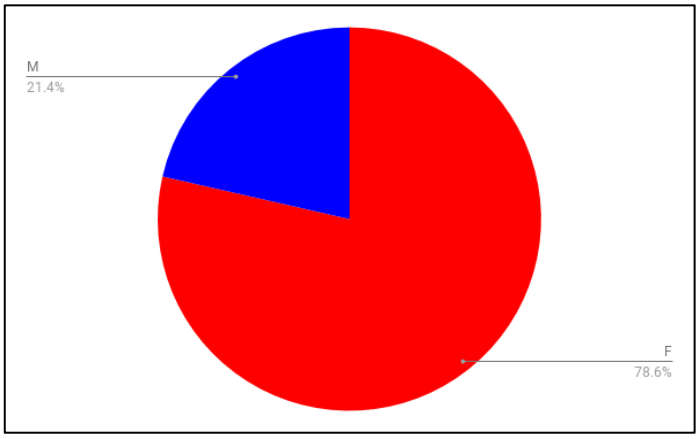


Figure 33: Sample – Gender

The ratio of men in our sample roughly corresponds to the overall gender structure of teachers at lower-secondary schools in the Czech Republic: according to the report on gender by the Ministry of Education (Ministerstvo školství, 2017), the nation-wide ratio of male employees in education (excluding managing positions) in lower-secondary education is 22.1%.

6.2 Questionnaire data

6.2.1 Overview

Table 8: Questionnaire results – Overview presents an overview of the frequency of the items chosen by the respondents in the questionnaire and corresponding percentage. The items that we had marked as Key features of the CLIL lesson plan but ranked below the

top eight in the questionnaires are highlighted. K4: output scaffolding was selected with the same frequency as the C7 prerequisites, which is why there are actually nine features in the 'top eight',

None of the respondents selected the "Other" option, which suggests that our list of items was exhaustive. On average, the respondents selected 7.5 items, the majority selecting full eight options. The average frequency with which an item was selected was 19 (34%).

Table 8: Questionnaire results – Overview

	feature	frequency	% of all questionnaires
C2	worksheet	44	78.57%
K7	L2 attention	44	78.57%
K1	interaction	37	66.07%
K2	objectives	29	51.79%
K3	input scaffolding	29	51.79%
U10	worked out	24	42.86%
U1	structure	24	42.86%
C7	prerequisites	23	41.07%
K4	output scaffolding	23	41.07%
C8	instructions	22	39.29%
K8	multimodal	21	37.50%
C3	timeline	18	32.14%
K6	prior knowledge	16	28.57%
U3	review	15	26.79%
U5	reflective	13	23.21%
C6	ppt	11	19.64%
U4	assessment	11	19.64%
K5	HOTS	7	12.50%
U6	culture	7	12.50%
C9	FEP	4	7.14%

6.2.2 Research question 2

In this section, the Key features in their generality are discussed in greater detail to answer our research questions: **Does the Czech teachers' conception of a CLIL lesson plan match the key characteristics of a CLIL lesson plan? If not, where do *they* see the focal points of a CLIL lesson plan?**

Data shows that none of the questionnaires identified all our eight Key features; Figure 34 presents an overview of the numbers of questionnaires that featured a given number of criteria.

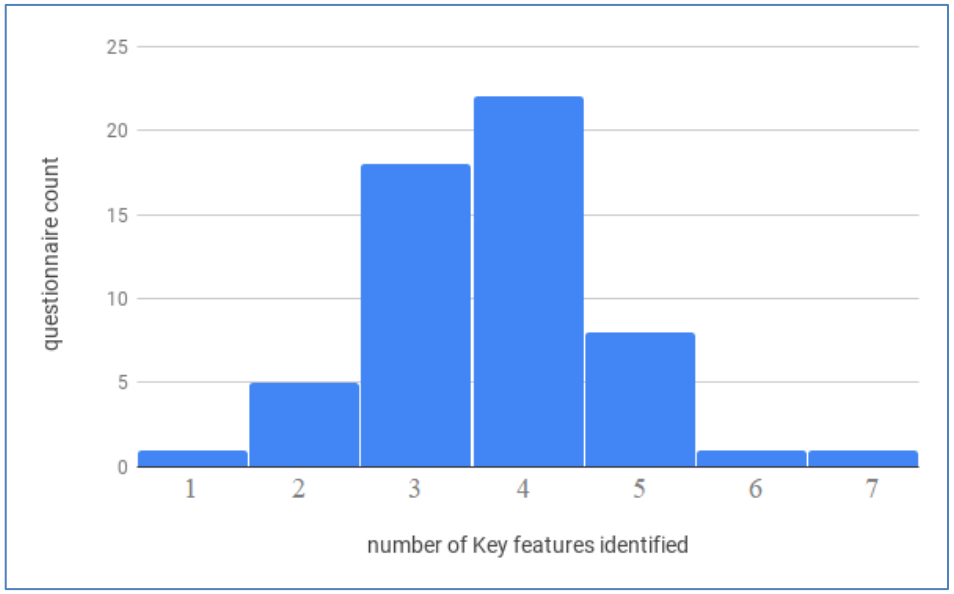


Figure 34: Questionnaire data: How many questionnaires featured 1, 2, ...8 key features?

Strictly speaking, none of the responses in the questionnaire matched our CLIL lesson plan model; only 19.6% of our respondents identified more than a half of the Key characteristics. Out of the eight Key features of a CLIL lesson plan, 5 features were mentioned among the top eight (see Table 8 on page 103); besides, K5: higher order thinking skills were one of the least often selected features. This implies that our respondents' conception of a CLIL lesson plan does not match the CLIL lesson plan model identified through the Universal criteria.

In addition to the five Key items ranking among the top eight (specifically, K7: Attention to L2, K2: Objectives, K1: Interaction, K3: Input, and K4: Output Scaffolding), the respondents identified Worksheets, Structure and Solutions as the primary features of a CLIL lesson plan – the worksheet was the most frequently selected feature with 78.57 % of our respondents placing it among the top features.

Worksheet

The worksheet was one of the two the top-ranking items with 79 % of the respondents. The universally observed scarcity of CLIL materials (cf. Eurydice, 2006; Coonan, 2007:628; Stohler, 2004: 267; Sudhoff, 2010: 34, Deller and Price, 2012, Wolff, 2007;

Kubů et al, 2012; Váňová, 2012, Šulista, 2014) would, in our opinion, satisfactorily explain the strong voicing of a hunger for a specific learning material: a worksheet. This, of course, without any qualitative data to support it, is a mere speculation – it might well be the case that the respondents actually felt that a worksheet was an inherent part of a CLIL lesson plan. In this respect, the validity of the questionnaire is hampered. The quantitative approach alone does not allow us to explain the position that the respondents might have adopted: when answering our instruction: "Select up to eight key features of a CLIL lesson plan", they could have either expressed their experience ("In my experience, a CLIL lesson plan usually includes…"), remembered information from the CLIL training ("I recall that CLIL materials had/were…"), voiced a wish ("I wish that a CLIL lesson plan had…") or they might have projected their lesson-planning intentions ("If I were to create a lesson plan to share with a wider public, I would include…"), or perhaps they approached it with yet a different mindset. Since we do not have any input in this respect, we cannot make any assumptions.

HOTS

The item with the most significant difference in attributed significance in a CLIL lesson are the Higher order thinking skills. Only 10.7% of the respondents identify HOTS as one of the key features of a CLIL lesson plan. This might be due to the fact that respondents were aiming more for CLIL-specific (stand-out) rather than CLIL-beneficial key features; nevertheless, this hypothesis would be in contradiction to the respondents giving priority to Structure over Scaffolding. Another possible explanation is that teachers are not aware of the cognitive demands of CLIL, or perchance they do not deem HOTS important in their regular practice. It would be necessary to get more qualitative data from the respondents, and/or compare their side-lining of HOTS within CLIL context to their view on the importance of HOTS in regular contexts to view this fact within a more complex set of teacher's beliefs (cf. Zohar et. al, 2001).

Limitation

Apart from identifying the eight key features, our analysis tool did not weigh in the order of the items, hence it is impossible to draw further conclusions. The fact that no respondent selected the "Other" option suggests that the LPAT items were sufficiently exhaustive.

6.2.3 Tentative comparison with the piloting

The data was tentatively correlated to the data collected in the piloting using Pearson correlation coefficient. Items that had been excluded from the LPAT were neglected in the comparison. The resulting $r = 0.5836$ shows a moderate positive correlation (Evans, 1996) between the responses in the piloting and the main questionnaire research.

The chart in Figure 35 shows the percentage of the questionnaires in the piloting and in the main research that featured the individual items and ranks the items by the differences between the two surveys. Despite the overall positive correlation, there are salient differences especially in the case of a worksheet, and of interaction. Looking at the differences between the piloting and the main sample, we can see the following: there were predominantly non-L2 teachers in the piloting and there are approximately the same number of L2 – non-L2 teachers in our sample; there were predominantly respondents with no or less than 3 years of teaching practice, in dire contrast to our sample; thirdly, most of the respondents of our pilot sample underwent CLIL training in the past year, again, as opposed to the main sample.

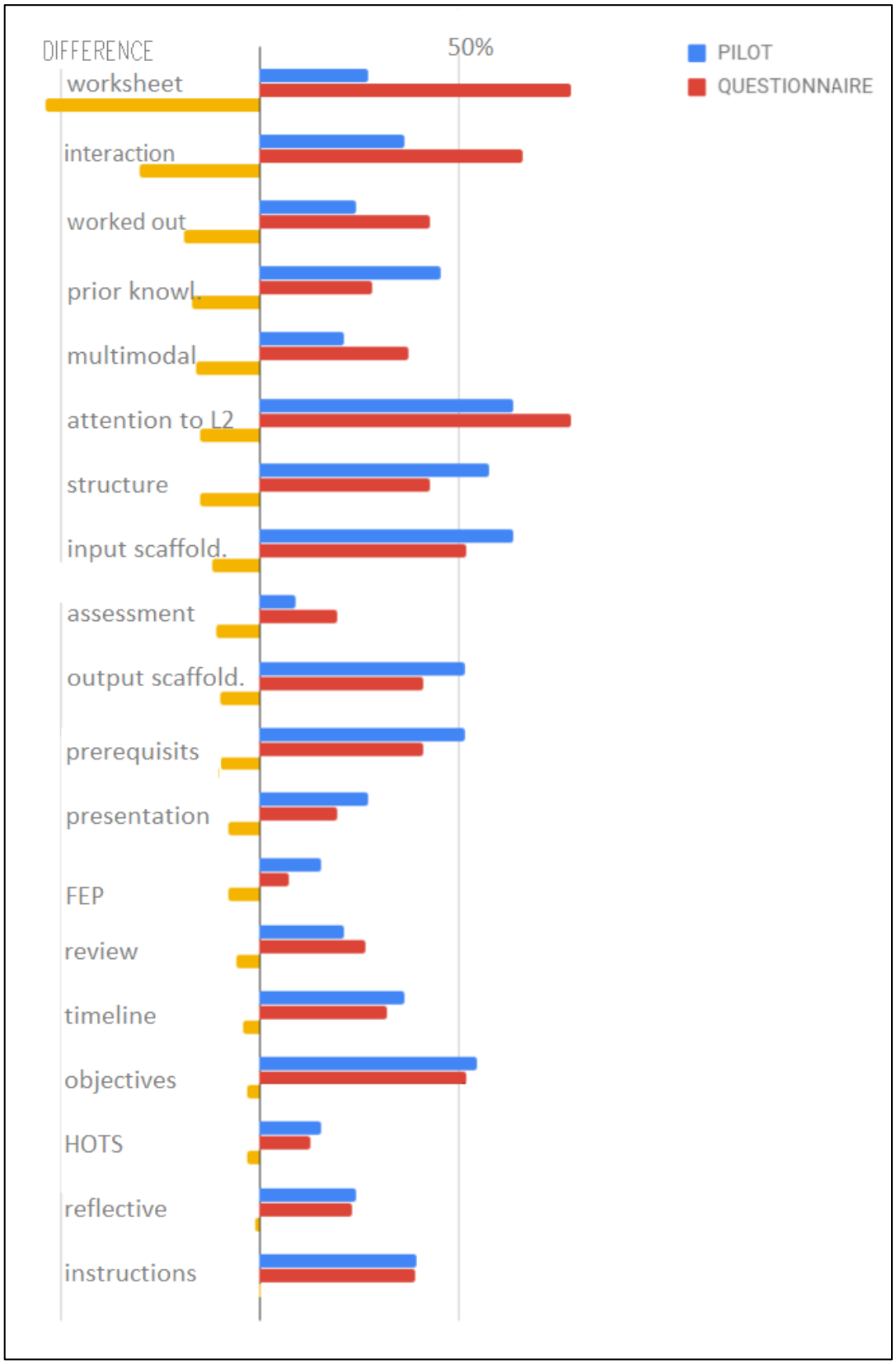


Figure 35: Tentative comparison of piloting and questionnaire

6.3 Lesson plans data

In this section, an overview of the data is given, followed by answers to Research question 1. This answer is elaborated in a detailed presentation of the evidence of individual LPAT items to provide insight in the specifics of the CLIL lesson plan collected in our research and comparison to other studies. Individual items are illustrated by examples taken from the lesson plans collected in our research.

6.3.1 Overview

We were able to identify each of the LPAT categories in the lesson plans, and the LPAT categories catered to all features or their manifestations observable in the lesson plans. Table 9 ranks the categories identified in the lesson plans by their frequency. The top eight categories identified in the lesson plans are highlighted; detailed analysis of some of the categories follows. The detailed discussion will be guided by the Key categories first, adding to them other relevant features, and finalizing the discussion with further categories.

Table 9: Lesson plans data – overview

	feature	frequency	% of lesson plans
K1	interaction	41	73%
K4	output scaffolding	40	71%
K7	attention to L2	37	66%
U1	structure	37	66%
C8	instructions for T	36	64%
C2	worksheet	32	57%
K8	multimodal	32	57%
K3	input scaffolding	31	55%
U4	assessment	30	54%
K5	HOTS	29	52%
C7	prerequisites	29	52%
K6	prior knowledge activated	27	48%
C3	timeline	26	46%
U3	review	16	29%
U6	culture	15	28%
K2	both objectives specified	14	25%
U5	reflective	12	21%
U10	solutions	10	18%
C9	FEP	10	18%
C6	presentation	6	11%

6.3.2 Research question 1

Do the Czech teachers' lesson plans feature the key characteristics of a CLIL lesson plan? What other characteristics manifest in the lesson plans?

In total, at least 2 of the Key characteristics were identified in each lesson plan; however, only one of the 56 lesson plans featured all the Key characteristics. On average, the lesson plans featured 4.6 Key categories. A "milder" coding of the K2 category was considered, recording all lesson plans that featured at least one objective (while "strict" coding required both content and language objective to be formulated). Figure 36 shows the comparison in counts of lesson plans that featured a given number of Key categories, comparing the "strict" coding of K2 and the "mild" one.

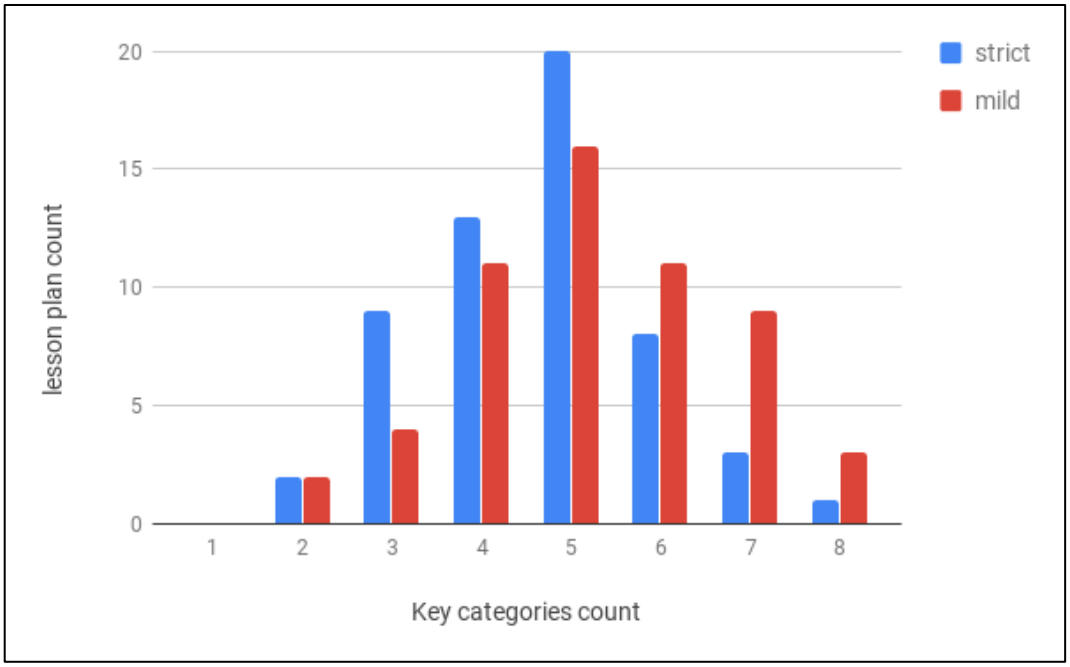


Figure 36: Lesson plans data – How many Key categories did the lesson plans feature?

The major part of the lesson plans featured at least half of the Key criteria. Figure 37 ranks the individual categories by frequency of appearance in the lesson plan, showing that six categories appeared in more than 50% of the lesson plans (with the average of each category appearing in 56% of the lesson plans). These values are calculated based on the strict interpretation of K2; should the mild version (at least one objective appearing

in 57% of the lesson plans) be considered, then seven out of the eight Key features appeared in more than 50% of the lesson plans, and all of them in 48% of the lesson plans or more.

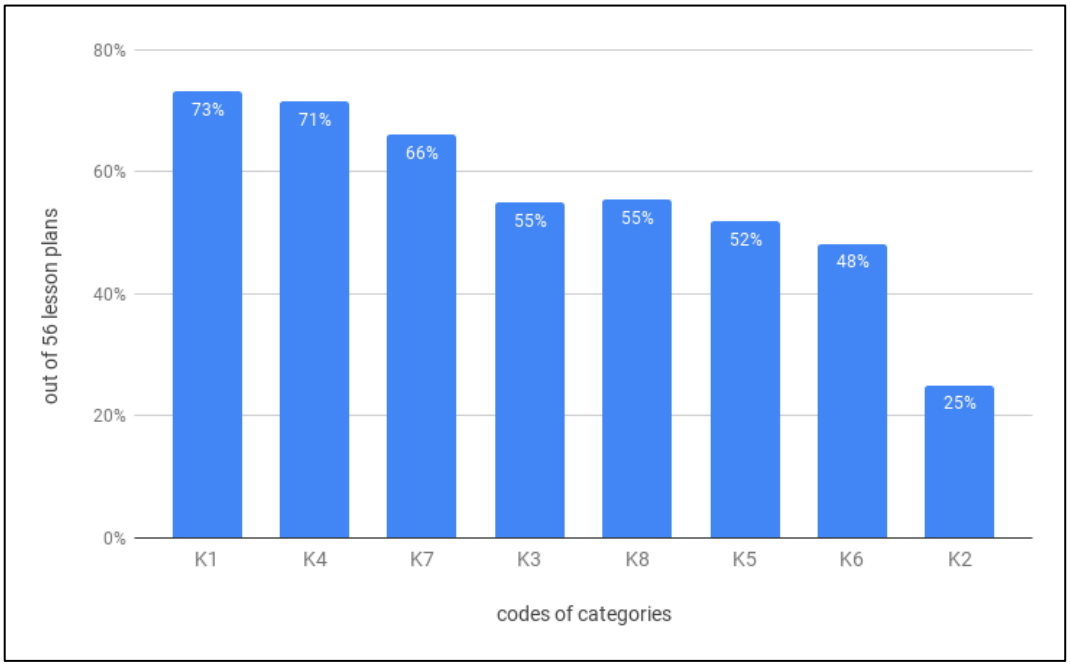


Figure 37: Lesson plans data: Percentage of lesson plans featuring a given category

Coming back to our first research question, we cannot convincingly claim that the lesson plans followed the eight Key principles – specifically, only one lesson plan featured a manifestation of all the eight Key characteristics. We may nevertheless conclude that most of the lesson plans featured at least 75% of the Key characteristics.

In addition to the most frequently employed Key CLIL lesson plan characteristics (interaction, output and input scaffolding, attention to L2 and multimodality), the lesson plans featured structure, instructions for the teacher and a worksheet among the eight most often recorded items. Details on all the items are included in the following subsections to elaborate on the second part of our research question.

6.3.3 Topic and content adequacy

There were four topics covered in all of the lesson plans:

- Shopping (buying, selling, discounts)
- Currency (currencies, exchange rates)
- Interests (saving, borrowing, rates, simple and compound interests)
- Budgeting (planning a budget, comparing income/expenses)

As opposed to the pilot study, none of the lesson plans featured Taxes as the main topic of the lesson.

We decided to present the overview of topic selected in context of content-level adequacy, see Figure 38. Interests were the most often selected topic, followed by budgeting, shopping and currency. In total, only 55% of the lesson plans corresponded to the curricular standards – 27% were aiming content standards lower than the given level, and 18 % aiming at a higher-than required level.

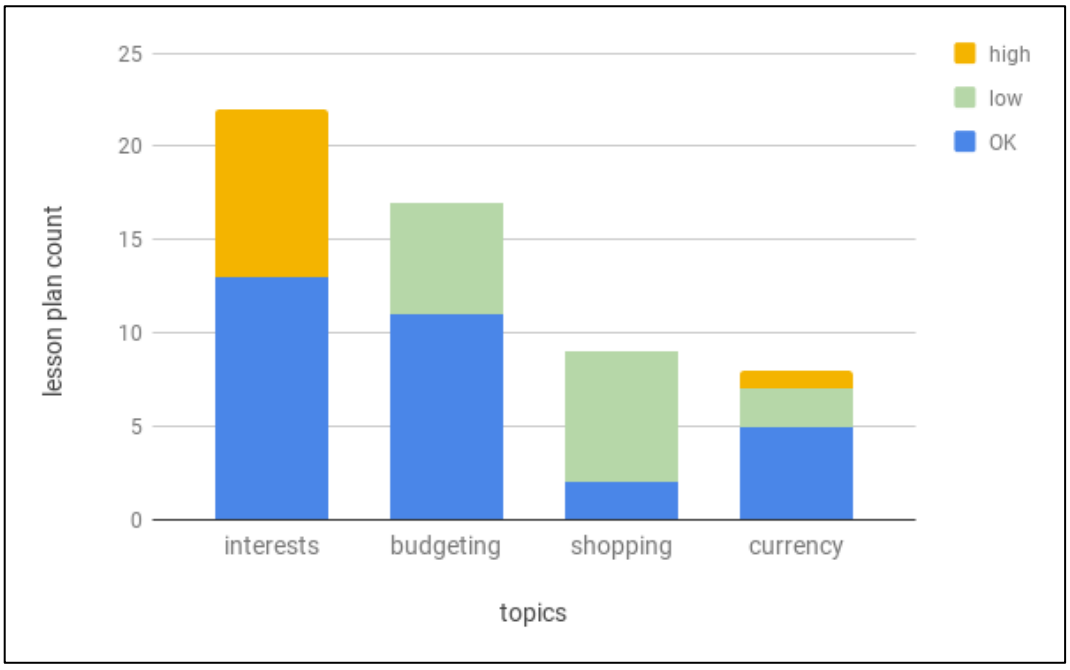


Figure 38: Lesson plans data – Adequacy of level of lesson plans based on topics

Three major content-adequacy issues appeared throughout the lesson plans. First, in some cases the content level was too simple for the last year of compulsory education (we used the Standard for financial literacy at schools (Ministerstvo financí, 2017) and Standards for Mathematics (Standardy pro základní vzdělávání) for reference: since the Financial literacy standards are formulated for the whole Lower secondary grade, we verified

whether the mathematical resource employed corresponded to final year of lower secondary, when applicable.) Second, in some lesson plans, the content surpassed the levels required by the Standard of financial literacy – that is, the lesson plans dealt with areas intended for upper secondary education levels. Thirdly, the input data of some of the tasks lacked realism (for example, the interest rates for saving accounts were unrealistically high or the prices in the tasks were unrealistic, without the task providing context that would legitimize the lack of realism).

Figure 39 compares the percentages of adequate content levels within each of the topics:

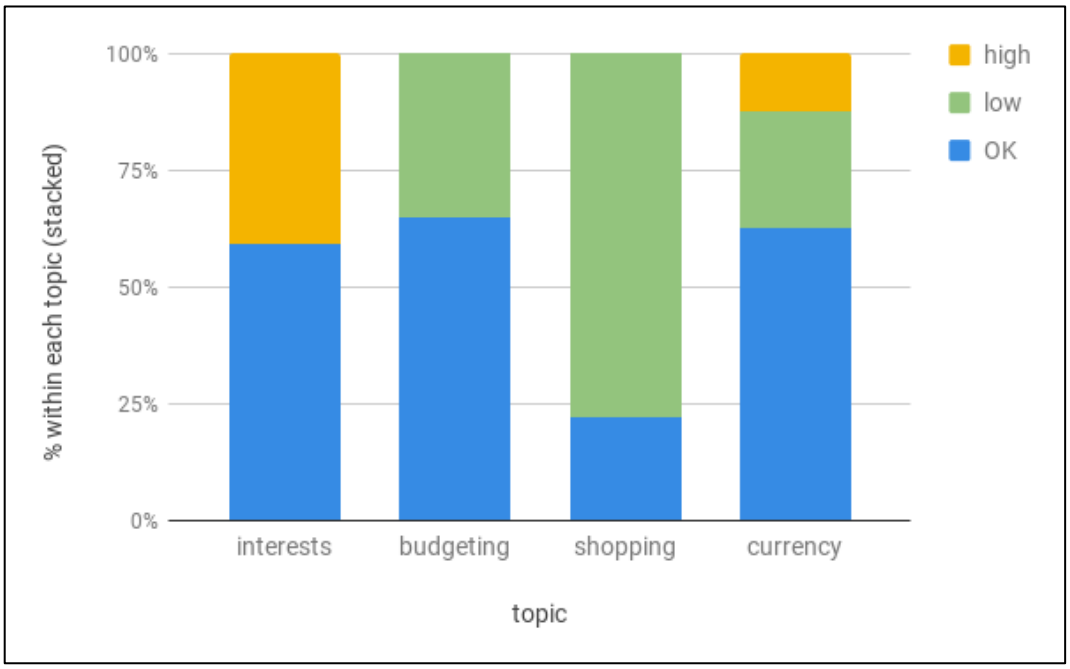


Figure 39: Lesson plans data – Levels within each topic (percentage)

We can observe that lesson plans on Currency and Budgeting mostly met the standards, while more than 75% of the lesson plans where the topic revolved around Shopping were below the Financial literacy or Mathematics standards for the last year of compulsory education. As far as Interests are concerned, the Standards explicitly place compound interests (and tasks to calculate "how long it will take to save for a particular purpose") in higher secondary education so all lesson plans dealing with either of the two calculations were evaluated as "high".

Pavón Vázquez & Ellison (2013, p. 71) observe that "lack of a high level of competence in the language could lead to compensatory tactics whereby lessons conducted in the

second language become those that simply "summarize" content which has already been explained in the mother tongue." We tested this in our sample by investigating the adequacy of content against levels of linguistic competence. Our data showed a completely contradictory result, with 10 out of 15 lesson plans featuring too low content level were designed by respondents claiming to have a C1 or C2 level of L2.

Without further qualitative research (e.g. interviews with the authors of the lesson plans), however, we shall not draw any conclusions: it is well possible that some authors decided for a lower-level content to make the CLIL experience more accessible to their students, another possible explanation might be that easier content might have been more convenient for the creators of the lesson plans than scaffolding a more advanced task; yet another cause for selecting a level below the Standards might be the lack of the authors' awareness of the adequate level. As for the "above-Standards" content (charted as "high" in the preceding figures), the authors might have base their lesson plan on a particular group of learners for whom this content might be well within their reach even if not required by the Standards or might have lacked the knowledge of the Standards.

As far as realisticism of the input is concerned, in total 75% of the lesson plans contained realistic input. We can see that there were most deficiencies in terms of accurate rates etc. within the topic of Interests. On the contrary, all of the input within the Shopping topic was realistic, see Figure 40.

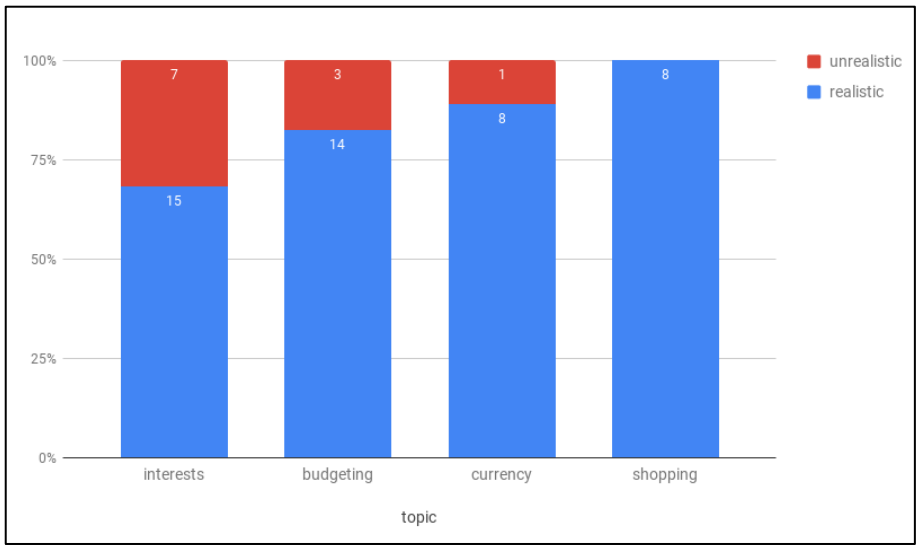


Figure 40: Lesson plans data – Was the input realistic? (by topics of lesson plans)

Our findings seem to go along with the worries that House formulates: “[In CLIL lessons] content may have to be simplified. (...) If this is the case, it is extremely worrying. Experts will claim that this is simply an example of CLIL being applied incorrectly." (House, 2007, p. 136). According to House, 27% of the lesson plans we analysed would be “applying CLIL incorrectly” just due to the inadequate choice of topic.

6.3.4 K1: Interaction

There were two manifestations of interaction observed in the lesson plans, either pair work or group work. Figure 41 shows the ratio of pair work and group work. Nine lesson plans included separate activities for pair work and group work. Out of the 29% that did not include any cooperative form of classroom organization, 7 only included individual or teacher-guided work and 8 did not mention forms of classroom organization. With 71% of the lesson plans featuring some form of peer interaction/cooperation, the category of Interaction seems to be well-evidenced in the lesson plans. It is however our displeasing experience that activities planned as pair work or group work can easily become individual activities with a specific seating order in the classroom. For the pair work/group work to serve its interactive purpose, cooperation and communication must be promoted and, if necessary, scaffolded. The investigation of this level, however, lies beyond the scope of this research.

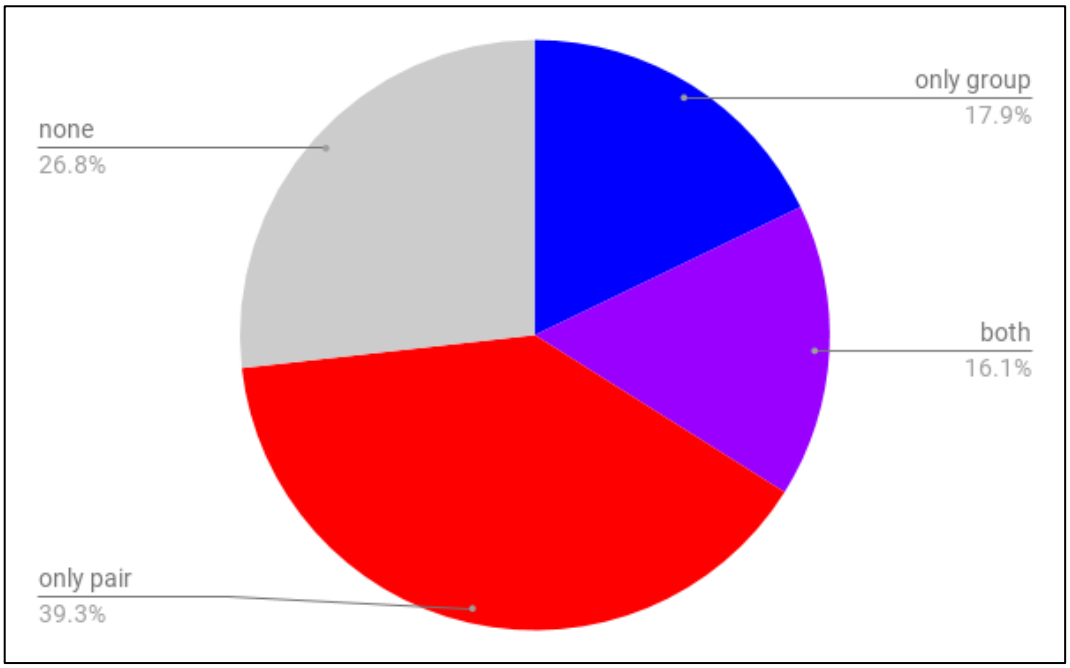


Figure 41: Lesson plans data – interaction

6.3.5 K2: Objectives

In the overview, we opted for a "strict" version of the K2 category, that is, we only considered a lesson plan to fit the category when it featured both content and L2 objectives, as befits CLIL principles. However, should a "milder" version of the K2 category be considered, settling for either L2 or content objectives, the K2 would rank seventh with 57% of the lesson plans. In section 6.5, the differences between L2 teachers and non-L2 teachers are discussed, also in connection to the type of objectives specified. Figure 42 illustrates which objectives were represented in the lesson plans.

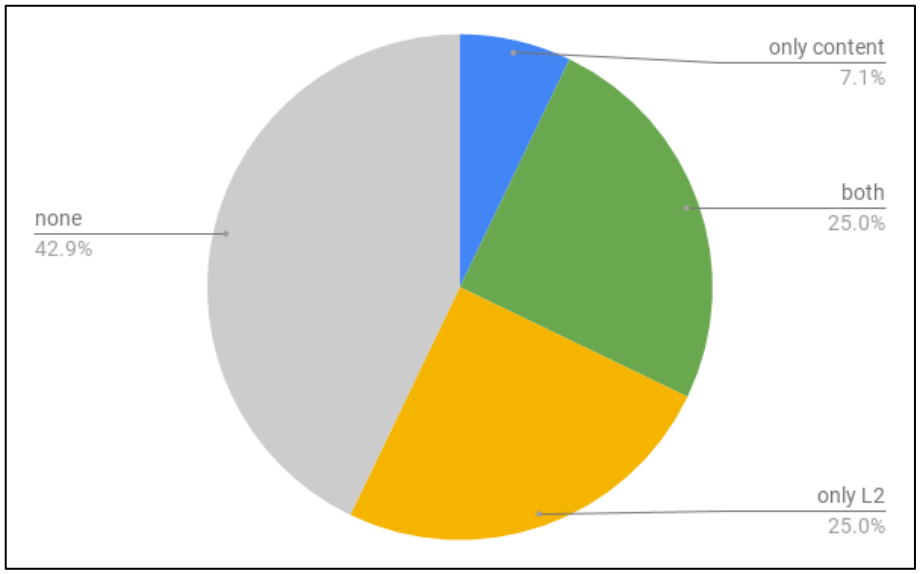


Figure 42: Lesson plans data – Which objectives do the lesson plans state?

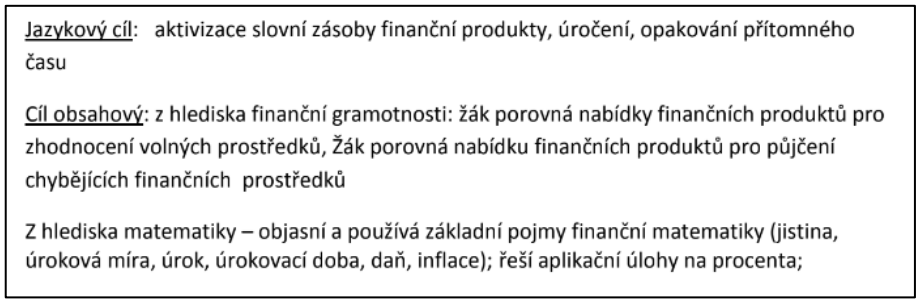
It is possible that while the teachers had considered objectives to a larger extent than manifested in the lesson plan, they did not record them in the lesson plans. Besides, Taylor (1970) analysed lesson plans by 261 teachers, finding that teachers tend to formulate the objectives only at the end of the lesson-planning. Zahorik (1975) had 194 teachers describe their lesson-planning approach and found that only 28% of them started planning from the objectives.

Bertaux et al. (2010) include formulating objectives and learning outcomes as a crucial aspect of Lesson planning competence in their CLIL teachers' competences grid. Puškáš also advocates the explicit formulation of objectives for CLIL, saying that "not being given clear objectives, some teachers as well as learners might struggle during the course" (2016, p. 17). Pavón Vázquez & Ellison (2013, p. 72) further point to the quality of L2

objectives claiming that in CLIL, "it would be a mistake to think that the content teacher should work (...) on establishing linguistic objectives different from "the ability or capacity" to do something with the language. (...) This would be to ignore that principle of language as a medium of instruction and not an end in itself."

Adopting Pavón Vázquez & Ellison's perspective, we examined the L2-related objectives, finding that only four lesson plans specified L2 objectives in terms of "the ability or capacity to do something with the language" (interestingly, all of them accompanied by content objectives), and the rest specified either grammatical or lexical objectives. We may sum up that the formulation of objectives corresponding with the CLIL principles is something rarely evidenced in the lesson plans.

Our research only evidences explicit formulation of the objectives in the lesson plan, see example in Figure 43 for explicit statement of the objectives from the perspective of L2 (focus on vocabulary and grammar only) and content (in terms of both financial literacy and Mathematics).


Jazykový cíl: aktivizace slovní zásoby finanční produkty, úročení, opakování přítomného času

Cíl obsahový: z hlediska finanční gramotnosti: žák porovná nabídky finančních produktů pro zhodnocení volných prostředků, Žák porovná nabídku finančních produktů pro půjčení chybějících finančních prostředků

Z hlediska matematiky – objasní a používá základní pojmy finanční matematiky (jistina, úroková míra, úrok, úrokovací doba, daň, inflace); řeší aplikační úlohy na procenta;

Figure 43: Example – Objectives[8]

We found that only a minority of teachers formulate their objectives in agreement with CLIL principles. Similarly, Shimizu (2008) in his mathematics lesson-planning experiments found that only 6.3 in-service teachers formulated objectives in their lesson plans. To mitigate this fact, Richards points out that when "teachers do write daily lesson plans, they do not state them in terms of behavioural objectives, even though they are taught this method in preservice teacher education courses" (Richards & Renandaya,

[8] Language objective: activate vocabulary on financial products, interests; reviewing present tenses; Content objective (financial literacy): learner compares financial products for saving/borrowing; mathematics: explains and uses financial mathematics terminology, solves applied problems using percent count.

2002, p. 32). McCutcheon (1980, p. 10) adds her own qualitative research supporting this trend and claims that that teachers often “do not follow the objectives-first model”.

Peterson et. al (1978) had teachers verbalize their mental processes while planning a lesson, and through content analysis recorded the frequency of statements on Productivity, Objectives, Subject Matter, Instructional Process, Materials, and Learner. In terms of Objectives, they found that "Even though the teachers were provided with a list of desired cognitive and affective student objectives, they did not refer to them in their planning, nor did they relate their choices of instructional processes to learning objectives" (Peterson, 1978, p. 424).

Montijano Cabrera add another possible angle to the explanation why so few teachers included the two objectives (as CLIL principles would require): “Many teaching practitioners working within this [CLIL] context find it difficult to apply a multiple focus on content and language” (Montijano Cabrera, 2012, p. 113).

6.3.6 K3: Input scaffolding

We recorded five different types of input scaffolding: pictures & illustrations, graphic organizers, multimedia, manipulatives, and adapted text, see Figure 44. The graphic organizers typically took form of a table (60 %) or a chart (40%).

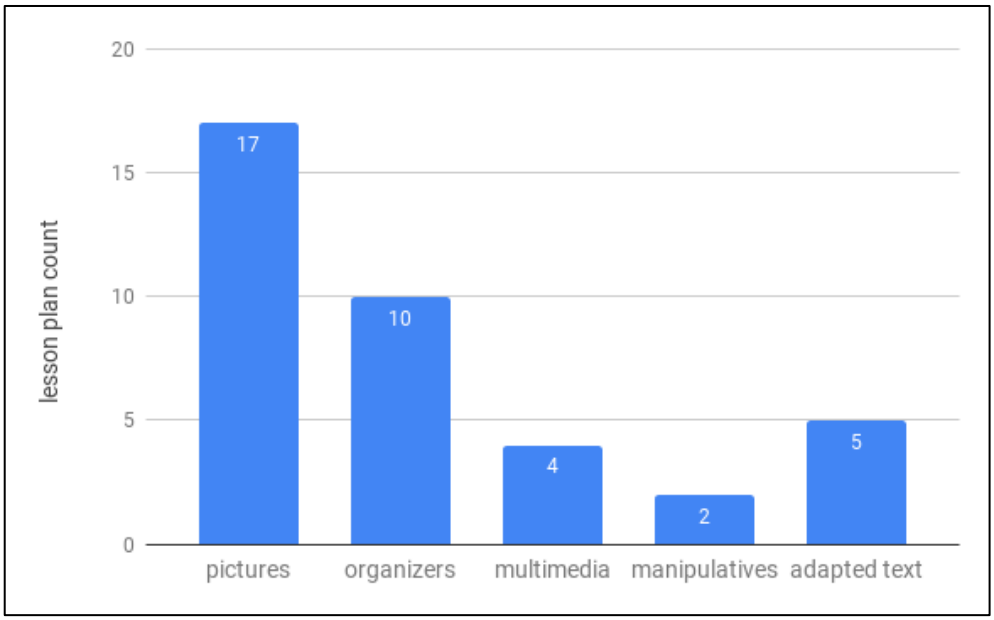


Figure 44: Lesson plans data – Input scaffolding

35.7% of the lesson plans did not use any instance of input scaffolding. In 41.1% we observed one form of input scaffolding, in 23.2% of the lesson plans, two occurrences of input scaffolding in one lesson were recorded.

Pictures or illustrations were by far the most frequently used form of scaffolding. Nevertheless, out of the 17 lesson plans that included this form of scaffolding, 14 featured merely an illustration relevant to the topic. Figure 45 shows a part of a lesson plan where the picture is used mainly as an illustration: it helps the learners identify the context quickly but does not contribute to their understanding of the task itself.

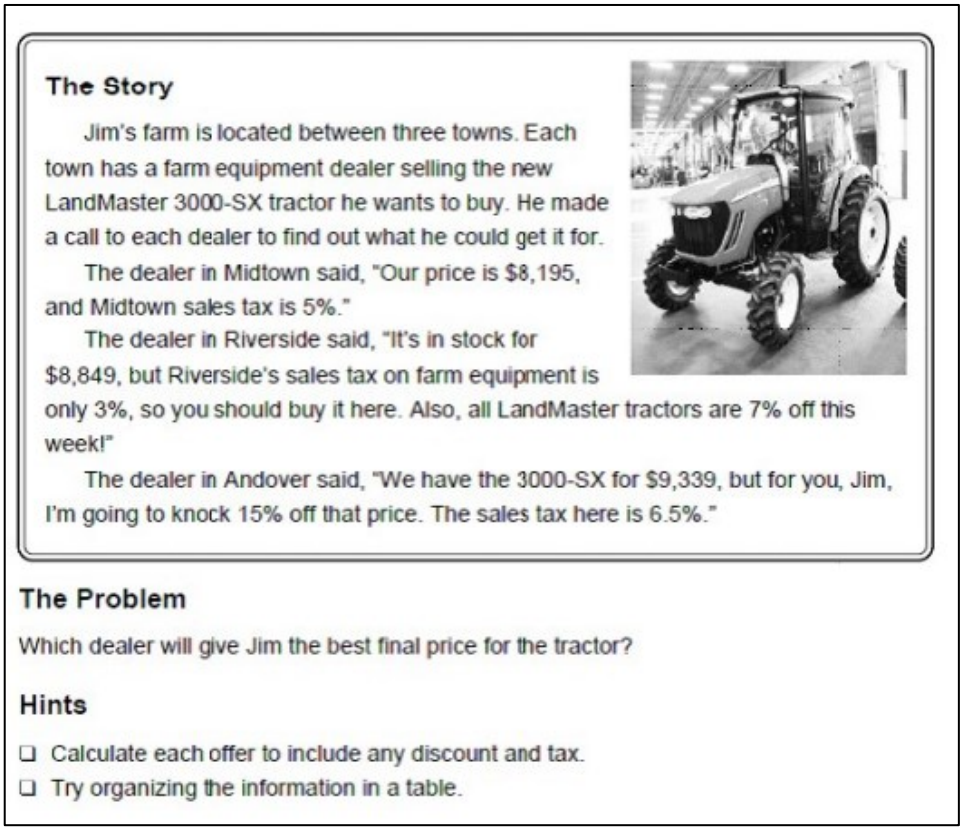


Figure 45: Example – Visuals used as illustrations

Moore and Lorenzo (2007, p. 23) identified three approaches to text adaptation in a module on CLIL: simplification, expansion, discursification. Due to the nature of the content represented in our lesson plans, hardly any of the lesson plans featured a longer text and thus it was not possible to investigate the approaches to adaptation. Adapted text was observed as a form or personalizing the level of the lesson to various levels of L2 among learners, see Figure 46.

For advanced pupils:

Greentree Landscapers employs 20 workers to do their planting and maintenance work. Each worker is paid $7.58 per hour. Compute the total payroll if each worker works a 40 hour week.
Greentree Landscapers recently purchased two trucks for $6982 each. Thez traded in an old truck and received a trade –in allowance of $735. What was final cost of the new trucks?

For lower levels:

20 people work in Greentree Landscapers. They work 40 hours a week and they get 7.58 per hour. How much money does the firm pay every week?

Greentree Landscapers sold their old car for 735 and they bought two new cars. Each new car cost 6982. How much money did they need?

Figure 46: Examples: Adapted text

6.3.7 K4: Output scaffolding

Three manifestations of output scaffolding were recorded:

- sentence frames, sentence starters, and fill-in exercises: in all three types, the learners are given parts of the sentences they are supposed to produce, and they fill in only the missing segment; fill-in exercises are usually intended to scaffold written output and frames and starters support oral production,
- non-verbal answers: may include total physical response (learners answer for example by standing up, they perform the required non-linguistic action); in Mathematics, this form of output may include answering through showing the correct numeric answer using fingers or a calculator, writing it in symbolic or iconic language,
- phrases for learners, modelled output.

Overall, some output scaffolding was present in 71% of the lesson plans. Out of the 40 lesson plans that featured one or more instances of output scaffolding, 20 offered phrases for the learners or a modelled answer and 21 employed sentence frames, sentence starters or fill-in exercises. Non-verbal answers were offered in 11 lesson plans. Most of the respondents employed one form of output scaffolding, see Figure 47 for percentage of the whole sample.

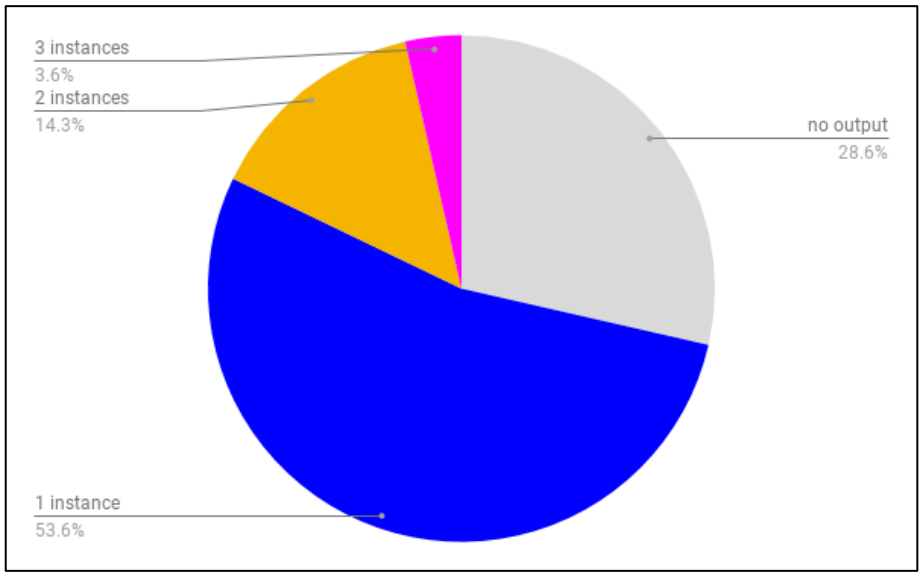


Figure 47: Lesson plans data – How many instances of output scaffolding did the lesson plans employ?

Figure 48 shows an exercise that allows the learners to write numbers in prepared "boxes" and continues with a matching exercise. The formulation of the task enables the more linguistically skilled learners to express themselves orally.

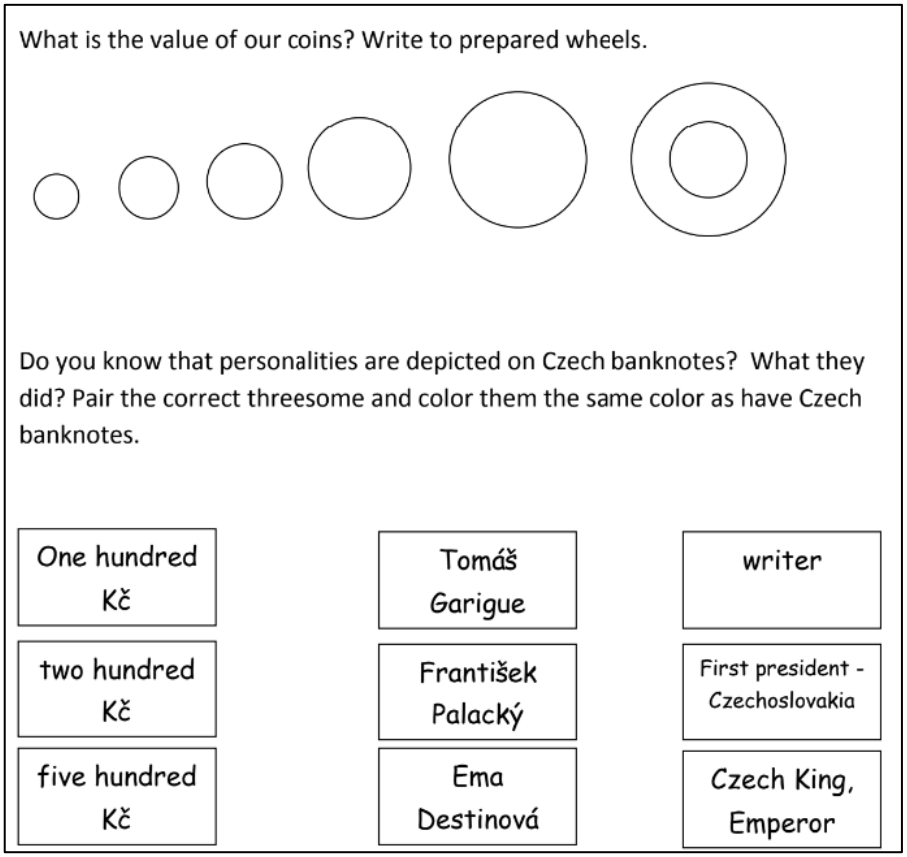


Figure 48: Examples: Non-verbal answering

Figure 49 makes use of ICT to scaffold output in a sorting exercise, inviting the learners to colour-code their answers. Besides, it features input scaffolding, by including the colour to be used in the title.

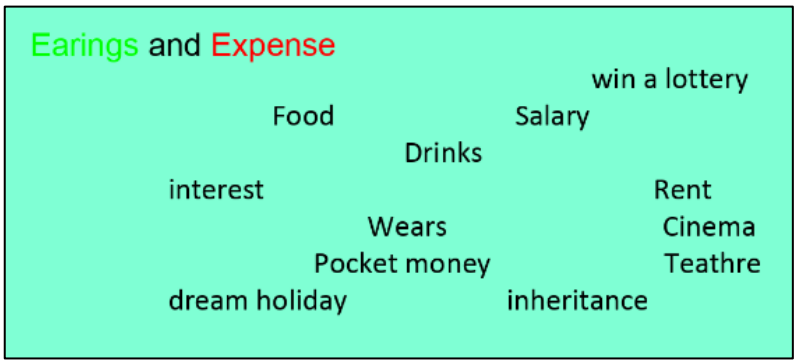


Figure 49: Examples: Colour coding on an interactive board

Figure 50 shows a scaffolded approach to reporting back in a word problem, employing a multiple-choice "test".

1. How many euros can Anna get at the bank?

A. 37 **B**.38 **C**. 39 **D**. 36

2. How many PLN she would need to buy 40 euros at the exchange office?

A. 152,80 PLN **B**. 156 PLN **C**. 152 PLN **D**. 148 PLN

3. After coming back from Berlin she had 15 euro. She exchange it at the bank for PLN. How many PLN did she get?

A. 57 **B**. 58,5 **C**. 55,5 **D**. 57,3

Figure 50: Examples – Multiple choice

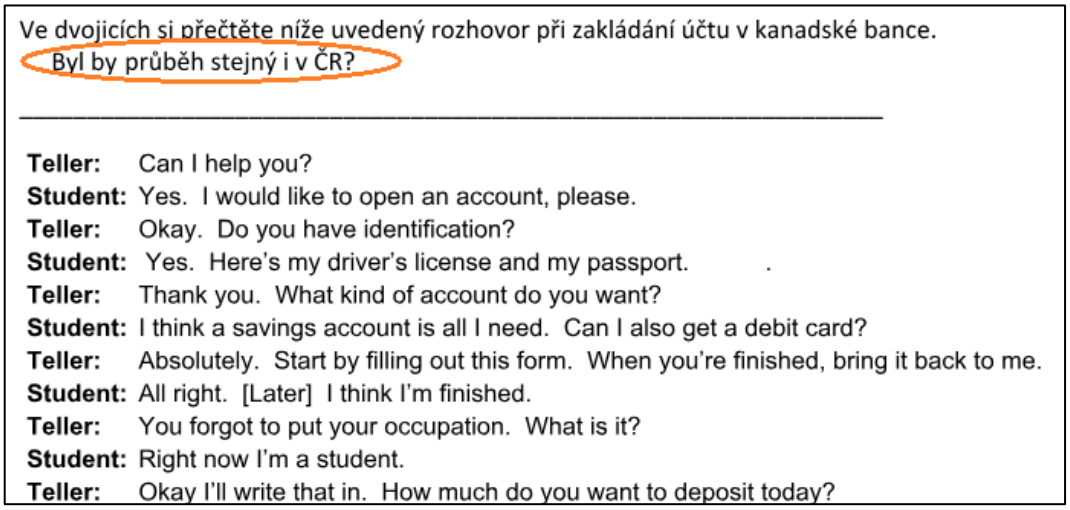
6.3.8 K5: HOTS

52% of all lesson plans included at least one task that invited learners to employ higher order thinking skills. Figure 51 gives an example of a higher-order thinking task, asking learners to analyse and compare the rates.

1.Decide which interest rate is the best for a loan:
a) A bank offers interest rate of 2% p.m.
b) B Bank offers 6% p.q.
c) C Bank offers 9% p.s.
d) D bank offers interest rate of 19% p.a

Figure 51: Examples: HOTS (analyse, compare)

Figure 52 shows an excerpt from a lesson plan that uses a reading/role-playing task to trigger a higher order thinking task, asking the learners to compare and contrast (if they had sufficient knowledge) or to hypothesise.



Ve dvojicích si přečtěte níže uvedený rozhovor při zakládání účtu v kanadské bance.
Byl by průběh stejný i v ČR?

Teller: Can I help you?
Student: Yes. I would like to open an account, please.
Teller: Okay. Do you have identification?
Student: Yes. Here's my driver's license and my passport.
Teller: Thank you. What kind of account do you want?
Student: I think a savings account is all I need. Can I also get a debit card?
Teller: Absolutely. Start by filling out this form. When you're finished, bring it back to me.
Student: All right. [Later] I think I'm finished.
Teller: You forgot to put your occupation. What is it?
Student: Right now I'm a student.
Teller: Okay I'll write that in. How much do you want to deposit today?

Figure 52: Examples – HOTS (conjecture, argue)[9]

Kersaint et al. (2014) argues the importance of higher order thinking skills when learning/teaching mathematics through a foreign language: "Effectively teaching mathematics content to English language learners (ELLs) requires instructional settings and situations in which students are engaged in solving interesting problems that encourage critical thinking along with basic skills development and practice."

Garrison (2011 in Georgius, 2013, p. 67) noted that the "teacher characteristics that play a role in achieving a level of cognitive demand of mathematical tasks are years of teaching experience and depth of mathematical knowledge. Teachers with more teaching experience (...) tended to plan and implement tasks of high cognitive demand more often than did their less experienced and knowledgeable counterparts." To test this observation on our sample, we charted the ratio of teachers who included HOTS in their lesson plans to those who did not. In CLIL-experienced teachers, there was a trend of higher ratio of HOTS based on years of teaching experience (apart from the two eldest respondents); in teachers without CLIL teaching experience, no trend could not be observed (see Figure 53).

[9] First line: In pairs, read the following dialogue about opening an account in a Canadian bank.
Second line (circled): Would the dialogue be the same if it took place in the Czech Republic?

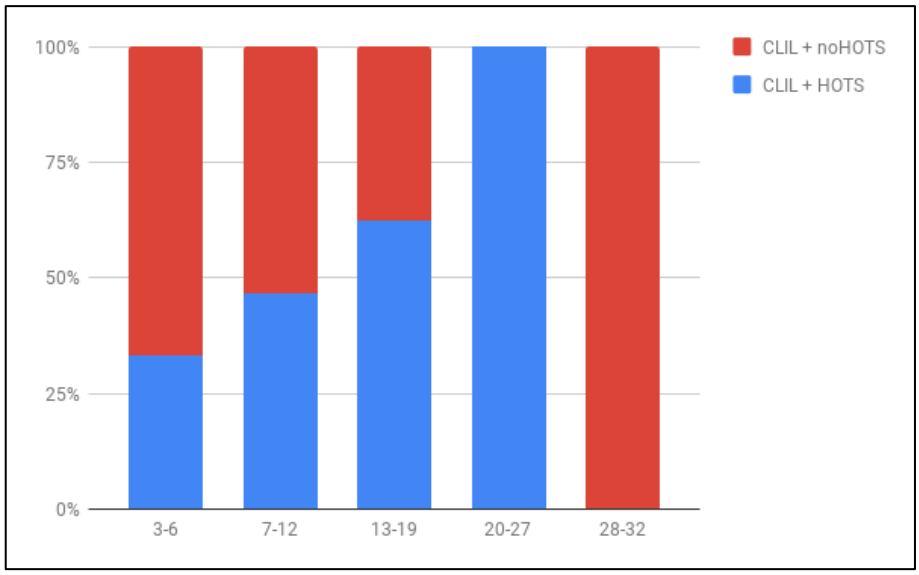


Figure 53: Lesson plans data: HOTS and teaching practice

6.3.9 K6: Prior knowledge activated & C7: Prerequisites

While recorded as two separate categories, we expected that formulation of prerequisites and activation of prior knowledge were intrinsically interlinked. However, the lesson plans did not confirm this among our respondents.

Altogether, some prerequisites were formulated in 73% of the lesson plans. However, both content and L2 prerequisites were present in only 12.5% of all lesson plans. Figure 54 shows the detailed data.

We hypothesised that L2 teachers would more frequently formulate L2 objectives and vice versa; the comparison of L2 teachers and non-L2 teachers is included in section 6.5.3.

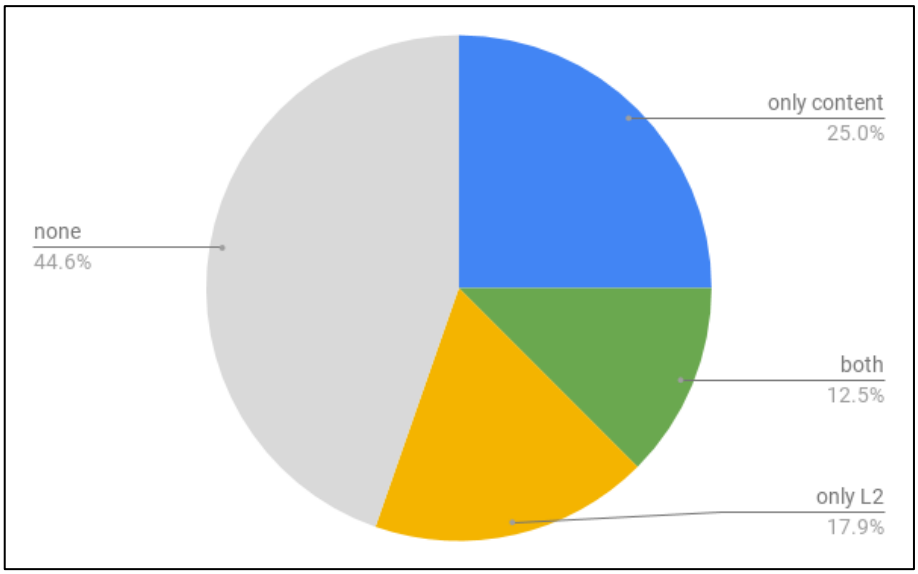


Figure 54: Lesson plans data – Prerequisites in the lesson plans

When it comes to activating prior knowledge, we recorded some form of activation in 48.2 of the lesson plans, with slightly more activities aimed at L2 activation than the activation of content, see Figure 55.

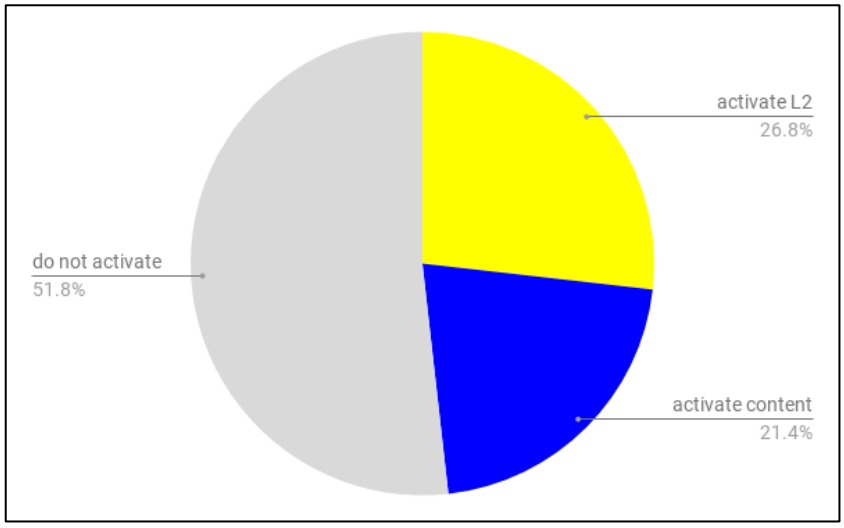


Figure 55: Lesson plans data – Activating prior knowledge

The chart in Figure 56 shows the ratio of lesson plans that activated prior knowledge, based on how many prerequisites they gave. We can see that the same ratio of prior knowledge activation or lack thereof was observable in roughly the same number of lesson plans not stating the prerequisites and giving only one prerequisite. Taking the lesson plans with both L2 and content prerequisites into account, we can observe increased occurrence of prior knowledge activation.

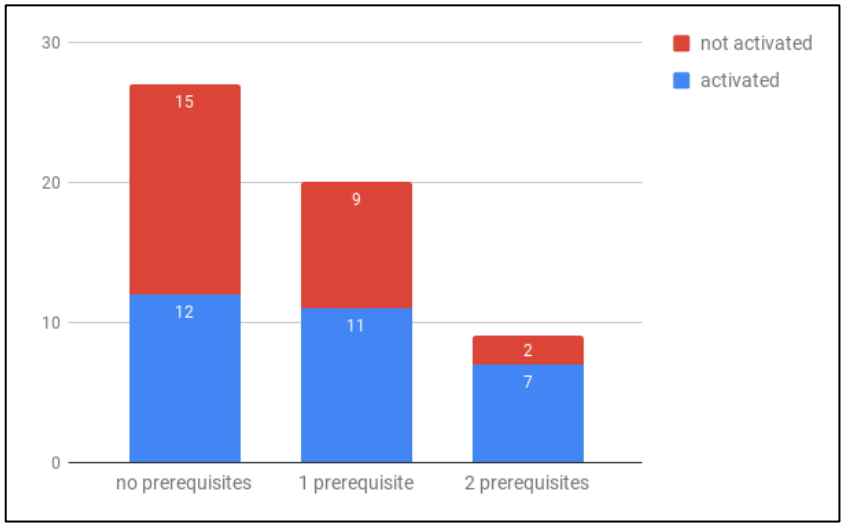


Figure 56: Lesson plans data – prior knowledge activation vs. prerequisite(s) specified

Figure 57 shows an initial warm-up exercise that has the learners calculate simple percent tasks. In the lesson, more problems that use these calculations follow; moreover, by starting the lesson by reading the expressions, the linguistic knowledge needed later in the lesson for reporting results and/or procedures is activated.

Úvodní opakování - 8 minut

Na začátku hodiny proběhne opakování toho, co žáci již znají a bude důležité při této hodině.
Úloha (Přečti anglicky a vypočítej).

(i) 1 % z 200 je
(ii) 5 % z 120 je
(iii) 15 % z 300 je
(iv) 8 % z 240 je
(v) 33 % z 300 je
(vi) 1 % je 3, 100 % je
(vii) 6 % je 42, 100 % je
(viii) 14 % je 56, 100 % je

Figure 57: Examples – Activating prior knowledge[10]

Figure 58 shows a beginning of a lesson where a task is seemingly in L2. Its objective however is for the learners to activate vocabulary connected to banking products.

[10] Revision: in the beginning of the lesson, we will revise what the learners know and will be important in this lesson. Task: Read in English and calculate.

Motivace (5min)

Jste na dovolené v Anglii a chcete si zde půjčit 100 liber, abyste si mohli koupit mobilní telefon, který si už dlouho přejete, a u nás není k dostání za takto výhodnou cenu. Splacení předpokládáte do jednoho měsíce. Jaká slovíčka budete potřebovat, když si budete chtít půjčit tento obnos od banky za co nejvýhodnějších podmínek?
Učitel píše na tabuli pojmy, které studenti říkají

Figure 58: Examples – Activating prior knowledge (vocabulary)[11]

6.3.10 K7: Attention to L2

Overall, 66% of the lesson plans featured some part focusing mainly on L2. We recorded three different types of L2-focused features: vocabulary list in 59%, L2-oriented task in 30%, and lastly, in 11% of the lesson plans all L2 segments were translated to L1. Figure 59 illustrates that out of those that did focus on L2 in one feature or more, the majority only presented a vocabulary list (in 30.4% of the lesson plans; by a vocabulary list we understand a glossary of terms of phrases, both monolingual and translation). Second most frequent option was to include the vocabulary list in a task: the learners were expected to create or complete a vocabulary list. By a L2-oriented task we understand an activity that does not develop the content and focuses mainly on some linguistic aspect of the lesson (e.g. a specific grammar point or a communication feature).

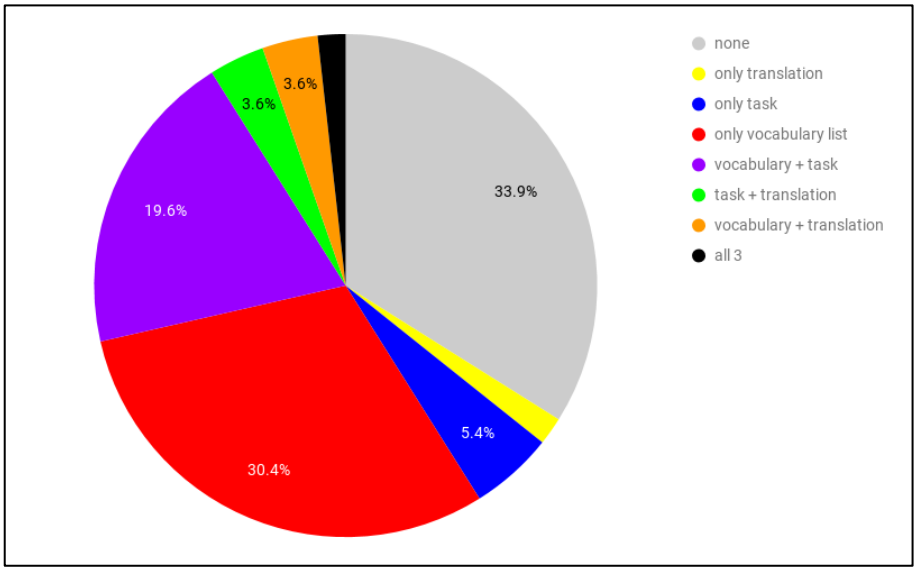


Figure 59: Lesson plans data – attention to L2

[11] Motivation: You are on holiday in England. You want to borrow GBP 100 to buy a phone you are longing for, it is much cheaper than at home. You expect to pay the money back within a month. What vocabulary items will you need to borrow this amount in a bank and you want the best rates?
Teacher writes learners' suggestions on the board

This category naturally overlaps with input and output scaffolding, since a glossary of terms and phrases may serve both as input scaffolding and as output scaffolding, depending on its use in the classroom. In our sample, it was not always possible to consistently establish the function the glossary was intended for; hence we limited our observation only to identifying whether it was a part of a L2-oriented task or a standalone feature of the lesson plan.

Banegas (2015) in his lesson-plan study observes that "all lesson plans featured content-obligatory language, such as specific terminology (...) but only a few of them also offered language work needed to complete tasks (such as producing a cohesive text or making a presentation to compare and contrast planets)".

Our study arrived at the same conclusion, with only one lesson plan developing language structures to carry out a task; the rest of L2-oriented activities aimed either for vocabulary or grammar.

6.3.11 K8: Multimodality

Multimodality is also interlinked with input or output scaffolding. In our study, we did not investigate the function in which the multimodal aspect appeared (whether it was the central task or a scaffolding technique) – scaffolding was recorded separately using the input-output perspective. 55.3% of the lesson plans included multimodal input or tasks. Figures 64–66 show examples of them.

In the example presented in Figure 60, the learners are expected to decode contextual information from a picture and use it. The task was included as an extension task at the end of the lesson. Based on this task, we hypothesised that multimodality might be connected to the activation of higher-order thinking skills – however, the overall data did not show positive correlation.

Try to invent your own interesting task with relation to this image. You can use your imagine. You can write bubbles into image (or you can do it like a strip and duplicate that image).

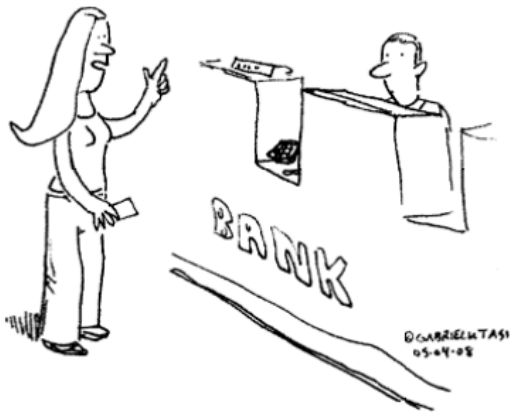


Figure 60: Examples – Multimodal input and HOTS

The task presented in Figure 61 was a final task in a lesson on conversion rates. It expects students to combine the tabulated data with the text. Moreover, it combines L2 and L1 (we do not engage in a speculation on whether this was the author's intention or neglection).

5. At the end of your stay you have 500 euros in your Spanish bank account. Now you have two options:
   a) Take the money in cash and convert it at the exchange office in the Czech Republic.
   b) Transfer the money from the Spanish bank account to your Czech bank account.

   In both cases your money will be converted into Czech crowns. However, the exchange rates will be different:

a) Exchange office

EUR / CZK	
Nákup	Prodej
27,8	28,4

b) Your Czech bank

EUR / CZK	
Nákup	Prodej
28,05	29,1

Which option will you choose: a) or b)?

Figure 61: Examples – Multimodality within a task

A third example (see Figure 62) presents a complex tabulated set of data and uses it for a) a vocabulary-oriented task, and b) a reading comprehension task – the learners need not calculate anything.

(20 minut) Učitel uvede následující aktivitu tím, že žákům rozdá tabulku[1] s měsíčním osobním rozpočtem Jamese, který pochází z USA a jasně vysvětlí zadání úkolu.

Category	Monthly Budget	Actual Amount	Difference
INCOME:	Estimate Your Income	Actual Income	
Income - Pocket Money, Babysitting	$65	$70	$5
Income Subtotal	$65	$70	$5
EXPENSES:	Estimate Your Expenses	Actual Expenses	
PYF Savings	$17	$17	$0
Mobile Credit	$13.95	$13.95	$0
Shopping	$15	$16	$1
Movies/Going Out	$10	$12	$2
Miscellaneous Expenses	Yoga: $5	Yoga: $5	$0
Expenses Subtotal	$60.95	$63.95	$3
NET INCOME: Income Minus Expenses	$4.05	$6.05	$2

Úkolem žáků je:

a) zamyslet se nad významem slov (ty učitel napíše na tabuli pod sebe):

MONTHLY BUDGET, ACTUAL AMOUNT, DIFFERENCE, INCOME, EXPENSES, ESTIMATE, SUBTOTAL, NET INCOME.

Žáci pracují ve dvojicích. Na některé významy slov by mohli přijít z kontextu tabulky, slovníky mohou používat.

b) vyhodnotit osobní rozpočet Jamese z hlediska přebytku nebo deficitu.

Figure 62: Examples – Multimodality: transfer from a table to a text[12]

Vlachos (2009, p. 197) holds that "ICT has a multimodal and vital role to play in CLIL, since it caters for the media and the resources that can enhance multidisciplinary learning, and provides the means that stimulate, guide, and facilitate students in their efforts to express themselves adequately and effectively in the target language." ICTs contributed to the multimodal aspect in 14 out of 56 of our lesson plans. However, none of these plans invited the learners to interact with the ICTs, thus not fulfilling the multimodal potential of ICTs in a learner-oriented manner.

[12] Text above the table: The teacher introduces this activity by distributing the table with James' personal monthly budget, and s/he clearly explains the task.
Text below the table: The learners task is to a) ponder on the meaning of the words (the teacher writes the list on the board); learners work in pairs, they might guess some meanings from the context of the table, they can use dictionaries. b) assess James' personal budget in terms of surplus/deficit.

6.3.12 U1: Structure & C3: Timeline

Timeline was evidenced in 46.4% of the lesson plans; it took the form of either giving the time for each of the stages (in 77% of timelines specified) or stating the time elapsed from the beginning of the lesson (23 %). Since the timeline clearly signalled the structuring of the lesson, we took it as one of the markers of lesson structure. Figure 63 presents the proportion of lesson plans offering both structure and time, lesson plans that boast at least three distinguishable stages, and the lesson plans that do not.

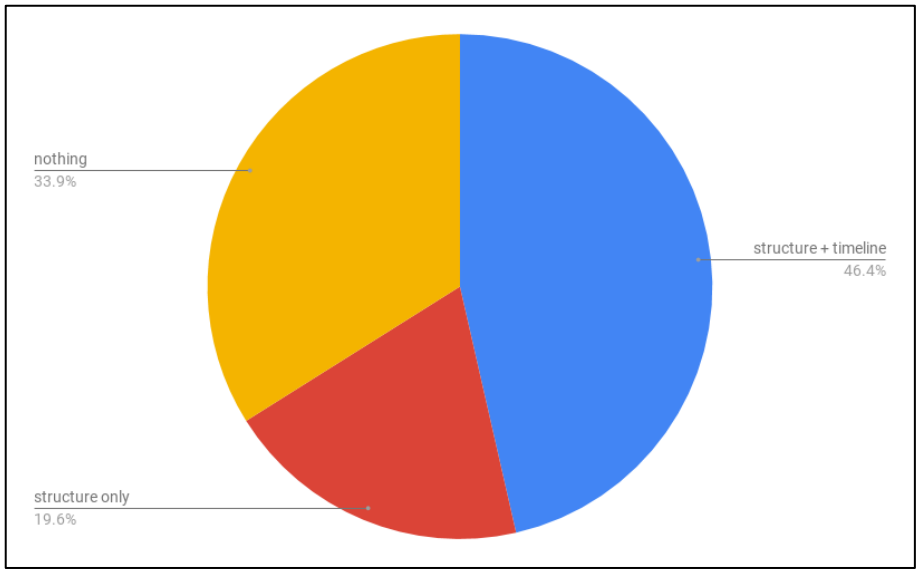


Figure 63: Lesson plans data – structure & timeline

Banegas (2015) investigated CLIL lesson plans by teacher trainees. He observes that the teachers included the following stages: "1. A warm-up stage, through which prior knowledge was activated and elicited. 2. A development stage, usually consisting of between 4 and 5 activities to introduce and engage with the target content and language. 3. A closure stage, through which the teacher recapped the contents of the lesson and set homework." (Banegas, 2015, p. 113). Banegas attributes the homogeneity in structure to previous lesson-planning sessions. No such homogeneity appeared in our lesson plans. Our respondents signalled from 2 to 7 stages in a lesson (the average was 3,7), and only 43% of the structured lesson plans included some form or a final review. Moreover, in almost 34% of the lesson plans it was not possible to identify more than two clear stages of the lesson – they would for example include only a set of mathematical problems to solve, or they would offer only a presentation from which the delimitations of individual stages were not discernible.

6.3.13 U4: Assessment

Assessment proved to be difficult to identify in the lesson plans. In the piloting, most lesson plans had an explicit assessment part. In the main study, in many of the lesson plans, there were activities through which would serve as unequivocal proofs of learning and on which formative assessment might be based, however, they were not marked or referred to as assessment. Since the LPAT did not provide a sound framework to deal with implicit assessment, it was decided to record a) stages explicitly described as assessment and b) instances of homework.

Adopting this approach, we found homework in 50% of the lesson plans, and explicit assessment sections in 5% of them. Notwithstanding, no conclusions are drawn from this fact since the finding is strongly limited by the LPAT.

On the other hand, the difference in terms of explicit assessment sections in the lesson plans in the piloting (with the majority of our sample being teacher trainees) and the main study (focusing on in-service teachers), corresponds to the findings by Shimizu (2008): in his experimental study 63.2% of the pre-service teachers in his sample included some remarks on evaluation at the end of the lesson plans, while only 8.5% of the in-service teachers did.

6.3.14 U5: Reflections and adaptations

In our sample, four lesson plans consisted of unaltered materials downloaded or copied from textbooks. Similarly, in Banegas (2015, p. 120) "3 trainees included materials taken without modification from general English course books". We conjecture that a certain amount of pre-service and in-service CLIL teachers both might tend to stick to ready-made materials without adapting them. It is perfectly possible that these teachers make the adaptations in the classroom; however, the implementation of the plans was not within the scope of our research.

The remaining 52 lesson plans all featured some form of adaptation to the learners. Most of it took form of input or output scaffolding (see the respective sections). As for the adaptations aiming at special needs learners, 25% of the lesson plans suggested

adaptations for special needs learners (by special needs students, we understand both learners who might need more assistance or time, and gifted students or skilled/faster learners). Of the 13 lesson plans, one offered adaptations both for "weaker" and "faster" learners, seven focused on faster/more advanced learners and the remaining five on students with learning difficulties. Altogether, this means that 9% of all lesson plans dealt with inconvenienced learners. This finding might relate to Pena Díaz & Porto Requejo's investigation of CLIL teacher beliefs: they found that in CLIL teachers' opinion, "students with special needs (...) are not fit to learn new concepts in English" (Pena Díaz & Porto Requejo, 2008: 160). However, the data that we are working in are not sufficient to confirm such a hypothesis.

Five lesson plans (9%) reflected on the possible problems that the learners might face during the lesson; all of them proposed a solution to the problems identified. All of the instances of reflection and suggested adaptations might be considered a manifestation of the analysis a priori (cf. Moraová & Novotná, 2014).

6.3.15 U6: Culture

Hallet (1998) argues against sciences in CLIL, arguing that they are scarcely culturally 'charged' (cf. Hallet 1998: 118) and would not allow for intercultural learning (which Hallet sees as one of the main aims of CLIL). With 27% of the lesson plans featuring explicit aspects of cultural differences and thus opportunities for intercultural learning, we do not agree to our sample being "scarcely culturally charged."

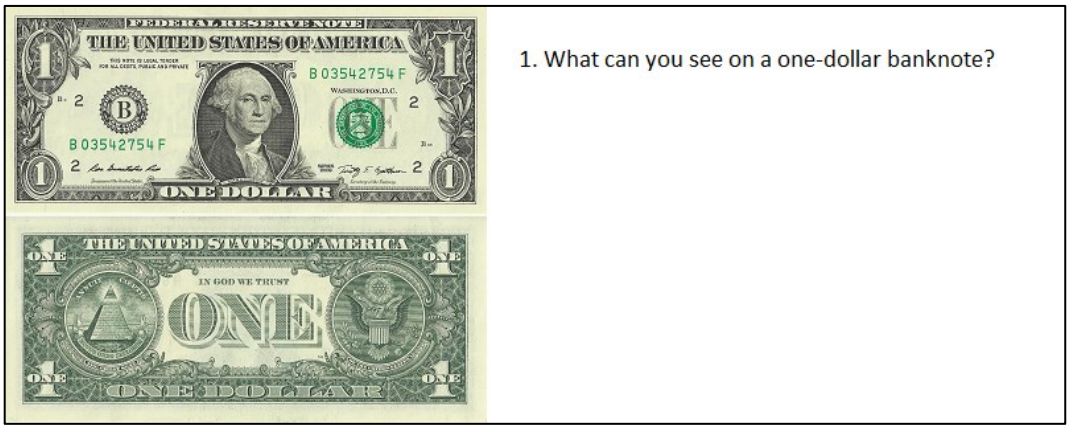
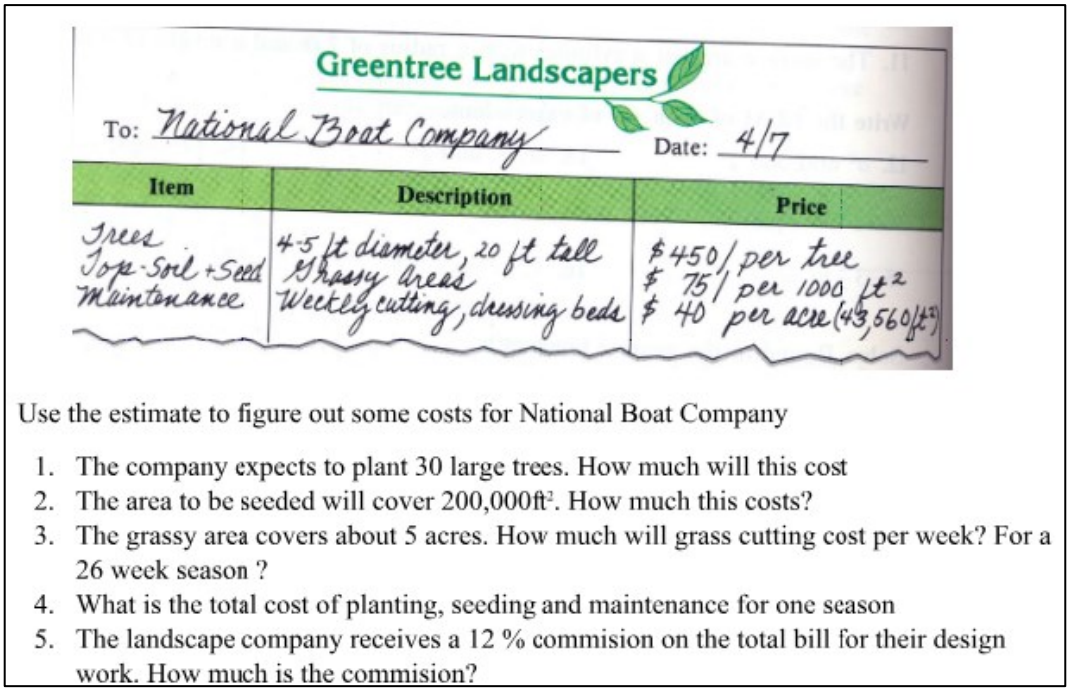


Figure 64: Examples – Culture awareness

In the task in Figure 64, the image of the dollar banknote is used in the beginning of the lesson – the task to identify features of the banknote can serve as basis for profound intercultural learning.

On the other hand, the fact of being "culturally charged" may present a further challenge for the learner. Novotná a Moraová (2005) point out the influence of culture in word problems, where a context may be familiar in Anglo-Saxon culture but would require explanation for Czech students. This proved to be an issue in several of the lesson plans.

In the task below (Figure 65), not only the level of language is well above A2; the context of contracting a landscaping company would very likely be unfamiliar to most learners in their final year of compulsory education. There are, moreover, even more pressing cultural-linguistic issues: the units for area, and the handwriting in the estimate.



Greentree Landscapers

To: National Boat Company Date: 4/7

Item	Description	Price
Trees	4-5 ft diameter, 20 ft tall	$450/ per tree
Top-Soil + Seed	Grassy areas	$ 75/ per 1000 ft²
Maintenance	Weekly cutting, dressing beds	$ 40 per acre (43,560 ft²)

Use the estimate to figure out some costs for National Boat Company

1. The company expects to plant 30 large trees. How much will this cost
2. The area to be seeded will cover 200,000ft². How much this costs?
3. The grassy area covers about 5 acres. How much will grass cutting cost per week? For a 26 week season ?
4. What is the total cost of planting, seeding and maintenance for one season
5. The landscape company receives a 12 % commision on the total bill for their design work. How much is the commision?

Figure 65: Examples – Culture-specific issues

The task presented in Figure 66 is not challenging linguistically or cognitively, the learners are supposed to repeat a calculation they had practiced in a preceding activity. However, the cultural context might be confusing: the local sales tax rates might come natural to an American but not to a Czech learner. Since this particular lesson plan only featured the title and a worksheet, we have no evidence on how the teacher is expected to deal with this cultural aspect.

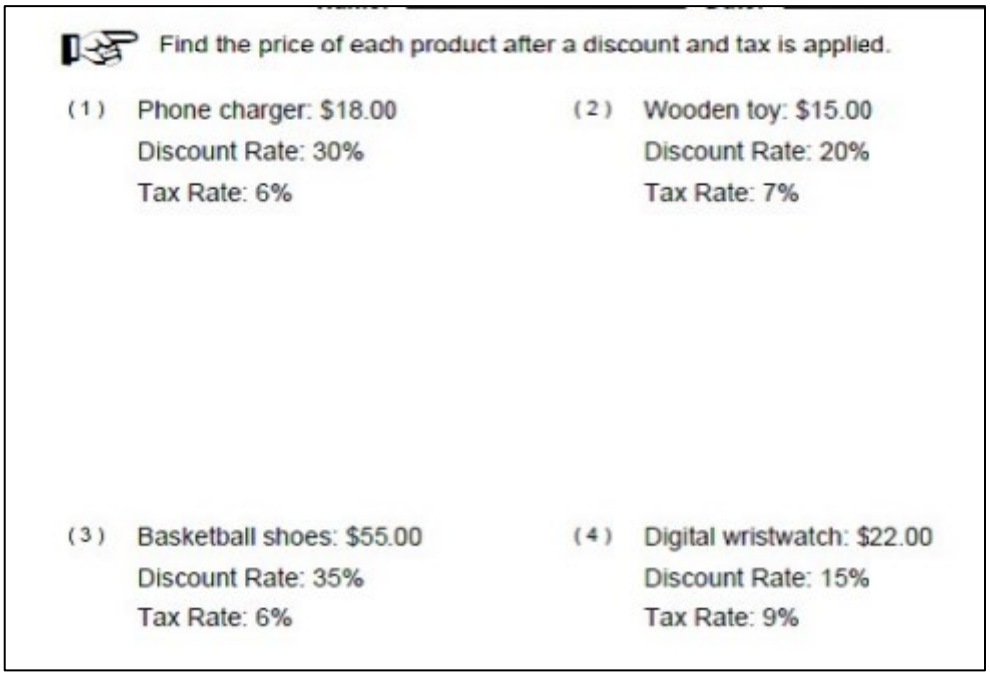


Figure 66: Examples – Culture-specific issues

6.3.16 U10: Tasks worked out

Half of the lesson plans included correct solutions to the tasks, 17.9% were worked out, that is, there was a model of a correct solution of the main activity of the lesson (including procedure, notation etc., as required by the particular task), and further 32.1% included correct solutions to the tasks (see Figure 67).

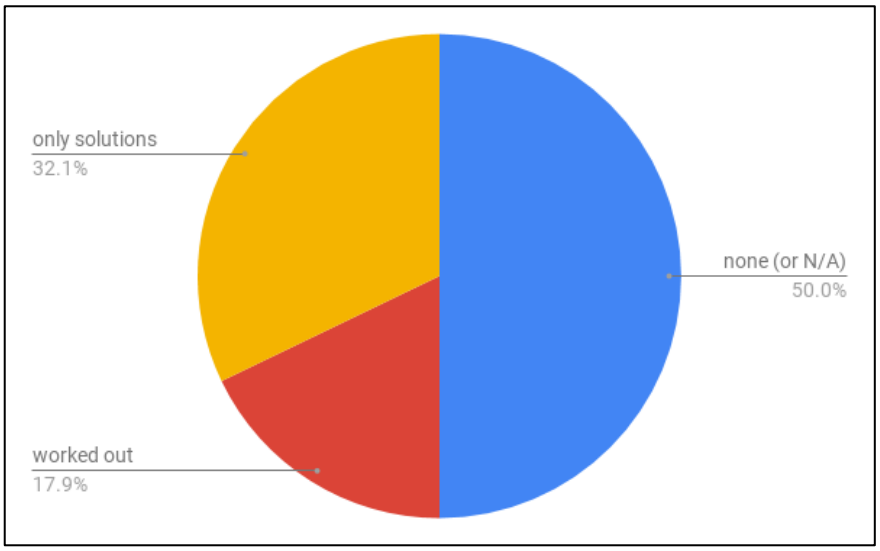


Figure 67: Lesson plans data – Solved and worked out tasks

In some of the lesson plans, the main activity was of such a nature that it was impossible to include a modelled work-out in the lesson plan (for example, a classroom discussion).

6.3.17 C2: Worksheet & C6: Ready-made presentation

A presentation was recorded in six of the lesson plans. In three cases, the full lesson plan consisted only of the presentation: two of them added no comments or instructions and in one case, the presentation included notes on the timing and structure and the formulation of teacher's instructions in the comments of the individual slides. The remaining part of presentations was an appendix to the lesson plan, which featured the description of the lesson with instructions to the teacher. On one occasion, the lesson plan featured the description of the lesson, a presentation, and a worksheet for the learners.

Worksheets were included in 57% of the lesson plans. On five occasions, these worksheets were un-adapted materials (the sources were correctly given in three of them); four out of these five did not include any further comments or descriptions of the lesson plans.

Among the worksheets, 60% of them were included in a separate file as an attachment to the lesson plan, 40 % of them were incorporated in the main lesson plan file.

56% of all worksheets covered the whole lesson, meaning the learners were expected to work with it throughout the lesson. The remaining 44 % were limited to a part of the lesson.

11 out of the 32 worksheets included a vocabulary task in which the learners created a glossary (either translating or creating definitions), this means that all the lesson plans that included a glossary-completion task did so in a worksheet. A ready-made vocabulary list was included in 6 of the 32 worksheets: in this case, the vocabulary lists serves as a scaffolding tool.

3 of the 32 worksheets gave the instructions for each task both in L2 and L1; 5 featured instructions only in L1, independently on the language of the task itself; 6 included sections in L1 and sections in L2 (all of these were worksheets intended to cover the full lesson), and the remaining 18 were L2-only (including the five with no adaptations), see Figure 68.

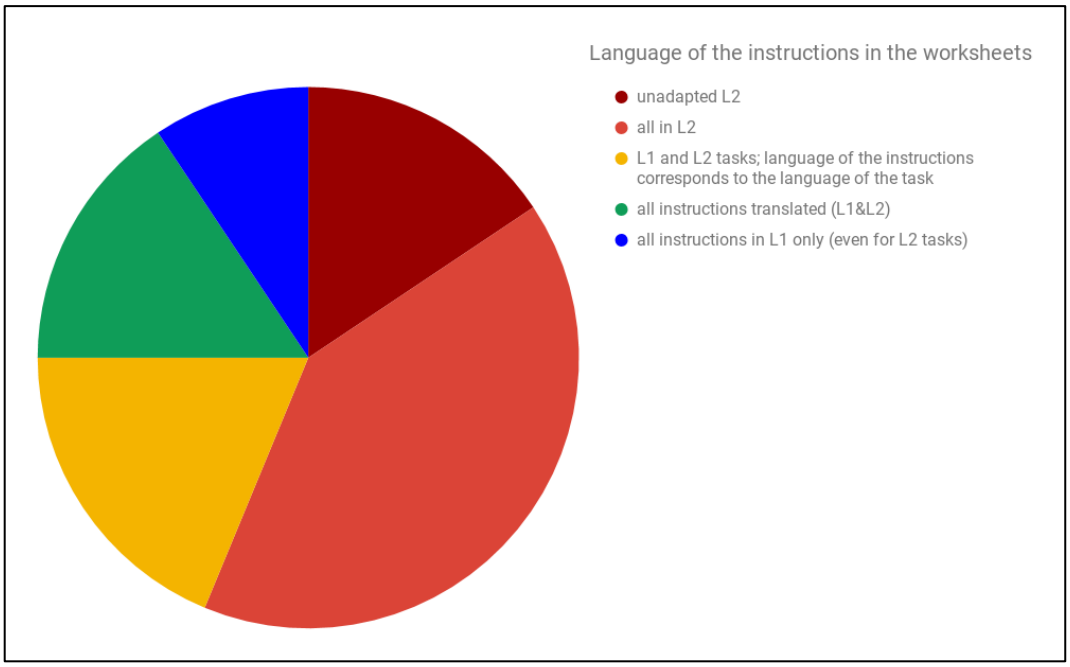


Figure 68: Lesson plans data – L1 and L2 in the worksheets

In Banegas' CLIL lesson plan study (2015), worksheets were included in 56% of the lesson plans, and un-adapted materials in almost 8%; in our research, worksheets were included in 57% of the lesson plans, and a total of 9% featured un-adapted material taken from existing teacher resources. Despite our samples differing in terms of teaching expertise and language/content orientation of CLIL, we arrived at almost identical findings. This allows us to hypothesise about whether planning a CLIL lesson around a worksheet might be a universally adopted practice, and we propose this hypothesis for further research.

6.3.18 C8: Instructions for the teachers

Instructions for the teachers were coded on several levels. Should a lesson plan explicitly state phrases for the teacher to use in classroom (instructions, feedback, questions…), it was coded as offering instructions for the teachers. To the contrary, lesson structure and timing by themselves were not coded as instructions for the teacher.

As for prepared phrases for the teachers, we recorded two categories: a) instructions and questions, and b) feedback. Feedback appeared in 6 of the 56 lesson plans – and always in a lesson plan featuring also instructions or questions for the teacher. The lesson plans varied as to the extent, language, form and structure of the instructions they offered. See Figure 69 for percentage of all the lesson plans that included a specific manifestation of instructions for the teacher.

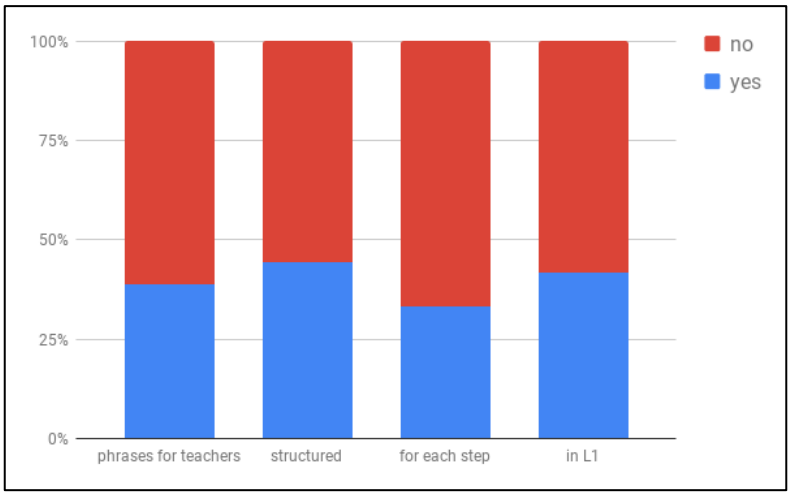


Figure 69: Lesson plans data – Instructions for teachers

Figure 70 shows an example of instructions for the teacher given in L1 in full sentences. The whole lesson plan focuses more on the teacher's action than the learners'. The instructions were incorporated in the overall description of the lesson.

První část hodiny vede učitel v Anglickém jazyku. Přivítá je a jednoduše jim vysvětlí, co se v hodině bude dít. Cvičení jsou připravené v přiloženém souboru smartnotebook pro interaktivní tabule. (3 min)

Figure 70: Examples – Instructions for the teacher: in L1, for each step[13]

Figure 71 shows an example of a lesson plan that gives the instructions to the teacher in the form of pre-formulated instructions that the teacher is supposed to use.

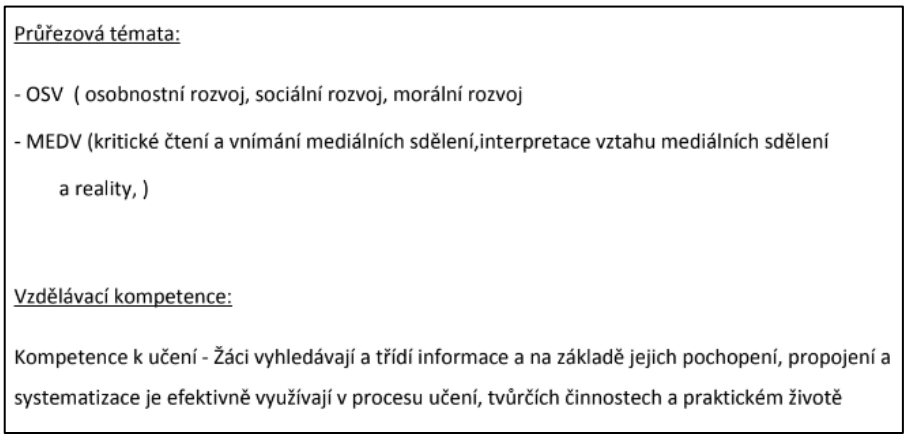
5 min recap:
we have 22.9% annual rate, that makes 0.06274% rate a day.
Let' s calculate the total sum, given that the bank amounts this on daily basis:
If we own 1 dollar, how much do we own after the first day?
1$ x 1.0006274
Second day?
(1$ x 1.0006274) x 1.0006274
etc.
A year?
(1$ x 1.0006274) raised to the power of 365, which works out as 1.257.
That means, the interests at the end of the year is 25.7%
(If needed, a re-explanation of the calculation of percentage)

Figure 71: Examples – Instructions for the teachers: in L2, phrases for the teacher included

[13] The first part of the lesson in in English. The teacher welcomes the learners and explains what will be happening in the lesson. The problems are prepared in a smartnotebook file.

6.3.19 C9: Framework education programme

17.8 % of the lesson plans analysed featured items relating directly to the FEP/SEP programme, see Figure 72 (relating to cross-curricular topics and to educational competence).


Průřezová témata:

- OSV (osobnostní rozvoj, sociální rozvoj, morální rozvoj
- MEDV (kritické čtení a vnímání mediálních sdělení,interpretace vztahu mediálních sdělení a reality,)

Vzdělávací kompetence:

Kompetence k učení - Žáci vyhledávají a třídí informace a na základě jejich pochopení, propojení a systematizace je efektivně využívají v procesu učení, tvůrčích činnostech a praktickém životě

Figure 72: Examples – FEP: cross-curricular topics and learning competences

6.3.20 Evaluative sections

37.5% of our lesson plans included only minor language mistakes (mistakes that do not complicate understanding), and 16 % contained major language mistakes (mistakes that would complicate understanding). In 62.5% of them, the language level was adequate; in the remaining 37.5%, the level of L2 was too high for the intended level of learners. Decimal separator was used in correctly in 66% of the lesson plans, out of these, in 57% it was the correct decimal separator in a L2 text or task. For content adequacy see section 6.3.3.

6.4 Lesson plans vs. questionnaires

In this section, we answer research question 3, and we provide details on differences between the responses recorded in the questionnaire and in the lesson plans. Special attention is dedicated to the Key categories.

6.4.1 Overview

Table 10 shows the overview of the frequency of LPAT items in the questionnaire and the lesson plans.

On average, there were more of the LPAT items observed in the lesson plans (on average, 9.3 items) than in the questionnaires (on average, 7.5 items). However, in the questionnaire, the number of responses was limited, so it is only logical that more items manifested in the lesson plans. To chart the differences, we had to weigh in the difference in average LPAT item count: we expressed the count for each item as a percentage of the total points recorded in the questionnaire or in the lesson plans, respectively. This allowed us to investigate the differences across categories in greater detail, see chart in Figure 73 on page 141 charts the data and ranks the differences in the individual LPAT items.

Table 10: Comparison Q/LP – Overview

code	item	questionnaire score	lesson plan score
K1	**interaction**	37	41
K2	**objectives**	29	14
K3	**input scaffolding**	29	42
K4	**output scaffolding**	23	40
K5	**HOTS**	7	29
K6	**prior knowledge**	16	27
K7	**attention to L2**	44	37
K8	**multimodal**	21	31
U1	**structure**	24	37
U10	**worked out**	24	10
U3	**review**	15	16
U4	**assessment**	11	30
U5	**reflective**	13	12
U6	**culture**	7	15
C2	**worksheet**	44	32
C3	**timeline**	18	26
C6	**ppt**	11	6
C7	**prerequisites**	23	29
C8	**instructions**	22	36
C9	**FEP**	4	10

.

Based on the differences, we distinguished four subgroups of items (see Figure 73):

A. Significantly more evidence in lesson plans than in the questionnaire: K5 – HOTS, U4 – assessment; coded blue in the chart,
B. More evidence in lesson plans: K4 – scaffolded output, C8 – instructions for the teachers; coded purple in the chart,
C. Comparable: U1, K6, U6, K3, K8, C9, C3, C7, U3, U5, K1, C6; coded orange,
D. More evidence in the questionnaire than in the lesson plans: C2 – worksheet, K2 – objectives, U10 – worked-out tasks, K7 – attention to L2; coded green.

In his study on teacher trainees' lesson planning for CLIL, Banegas (2015) compares a "How CLIL are you" reflective questionnaire to actual lesson plans by teacher trainees undergoing a CLIL training. He pinpoints aspects in which the students' self-reflection corresponds to the features in the lesson plans (namely activating prior knowledge, the use of visuals to introduce a topic, using visual organizers to scaffold learning, and Interaction and collaboration through pair and group work); he notices that while most trainees claim to promote language awareness and promotion of higher-order thinking skills, only a few of the lesson plans feature some evidence of either. In our sample, we arrived at a contrary conclusion in case of the higher order thinking skills: respondents did not include HOTS in the questionnaire but employed them in the lesson plans. In case of Interaction, our data show a significant consistency between the questionnaire and the lesson plans.

6.4.2 Research question 3

Do the Czech teachers' lesson plans feature the teachers' own "key characteristics" of a CLIL lesson plan? Are the teachers consistent in what they claim to be the key characteristics, and in what they employ?

We examined the correlation of the two data sets (questionnaire responses and lesson plans coded through the LPAT) using the Pearson correlation coefficient. The resulting $p_{LPAT} = 0.554$ shows a moderate positive correlation – there is a tendency for high scores in the questionnaire go with high score of the given category in the lesson plans.

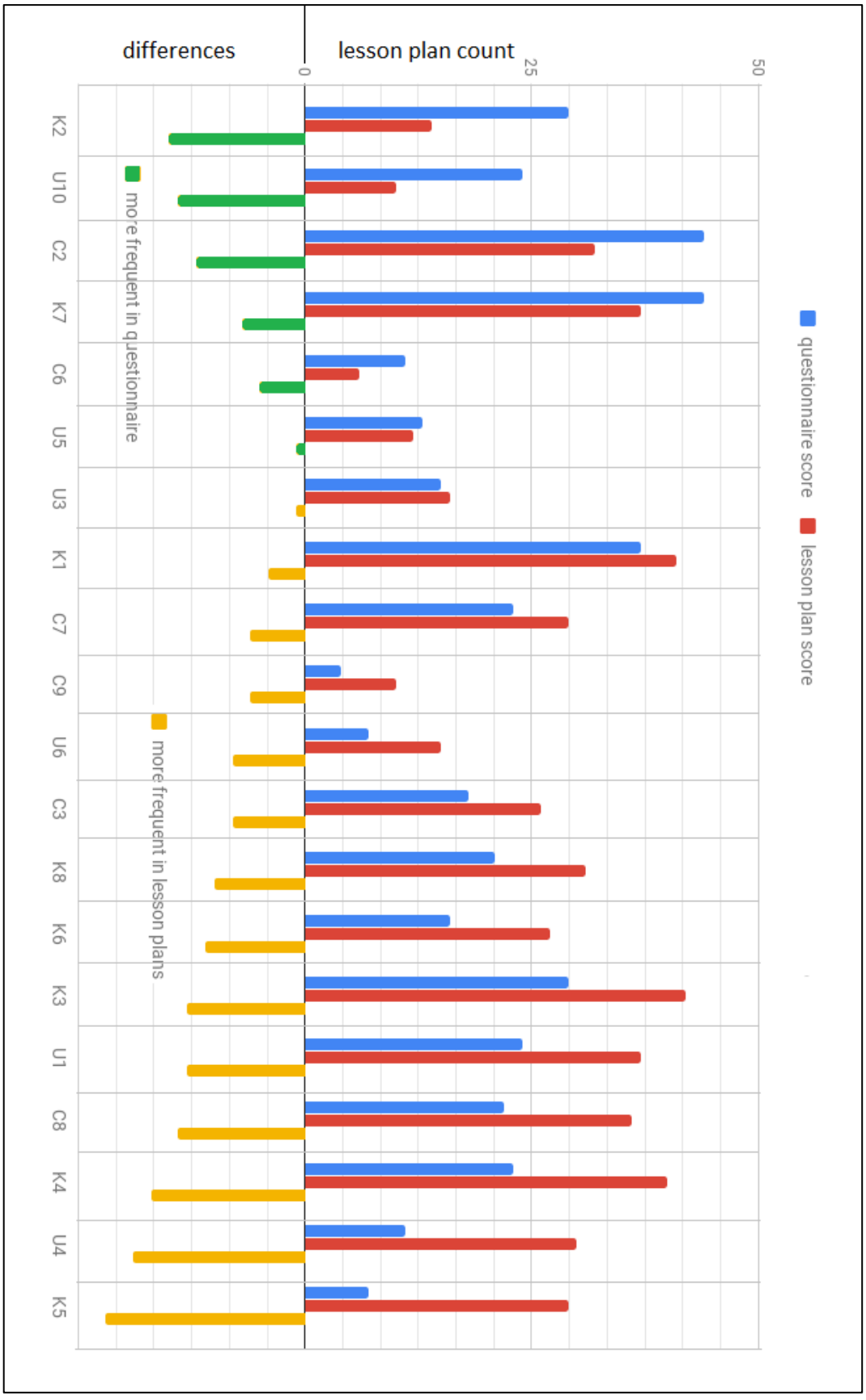


Figure 73: Comparison – differences in frequency in lesson plans/questionnaire

Looking into the Key categories in more detail, we calculated the Pearson coefficient for the K1-K8 categories with the result of $p_{K1\_8} = 0.328$ – weak correlation: while technically a positive correlation, the score is too low to convincingly establish a consistency of questionnaire and lesson plan data in terms of the Key categories. We can nevertheless point out that the consistency within the Key categories is lower than across all LPAT items.

When considering the "mild" form of coding K2: Objectives (see section 6.3.5 K2: Objectives on page 115 for details), the score across the key categories changed to $p_{K1\_8*} = 0.654$, and the overall correlation across the dataset to $p_{LPAT*} = 0.625$. If we took the questionnaire item to be "objectives for L2 or content", there would be a stronger overall consistency across LPAT and especially across the Key categories, too.

We can conclude that there is an observable trend of an overall consistency of the teachers' responses across the LPAT items, in other words, there was a tendency among our respondents to reflect their own conception of a CLIL lesson plan in the actual lesson plan.

6.5 L2 teachers – non-L2 teachers

To answer our fourth research question, we split our sample in two cohorts and compared their results in the questionnaires and the lesson plans. In this section, the two cohorts are described, and then data from the two stages of research investigated: questionnaire data and the lesson plans. At the end of the section, the fourth research question is answered.

6.5.1 L2 & non-L2 teachers – comparison of cohorts

This section presents the comparison of the two cohorts based on the independent variables.

Figure 74 illustrates how the self-assessed language levels differed in the two groups. This is a fact that we need to consider – not only do the groups differ in teacher training, there are significant differences in terms of their (perceived) language competence.

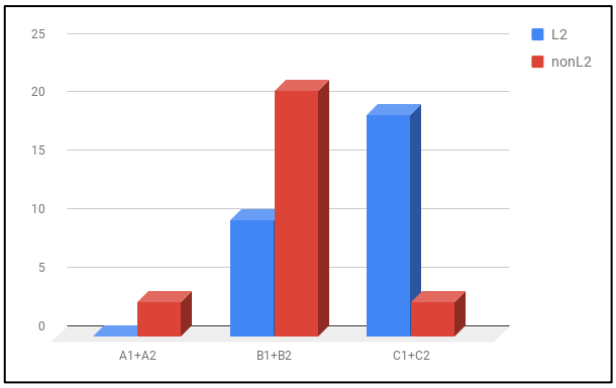


Figure 74: L2/ non-L2 – Language levels

Figure 75 shows what percentage within each cohort has had some practice with CLIL. While there is more CLIL teaching practice among the L2 teachers, in both cohorts at least one half of the respondents claims to have had CLIL teaching practice of some sort.

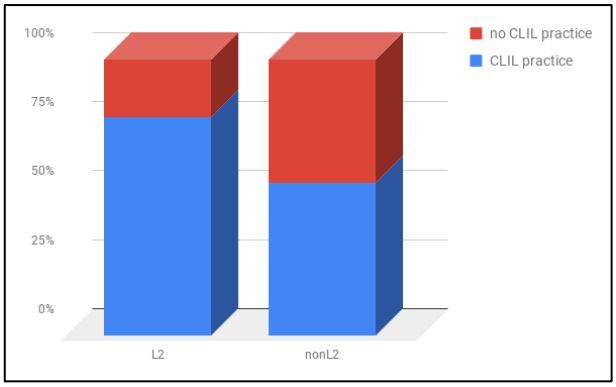


Figure 75: L2/ non-L2 – CLIL practice

Figure 76 illustrates the distribution of the respondents based on differences in terms of teaching practice.

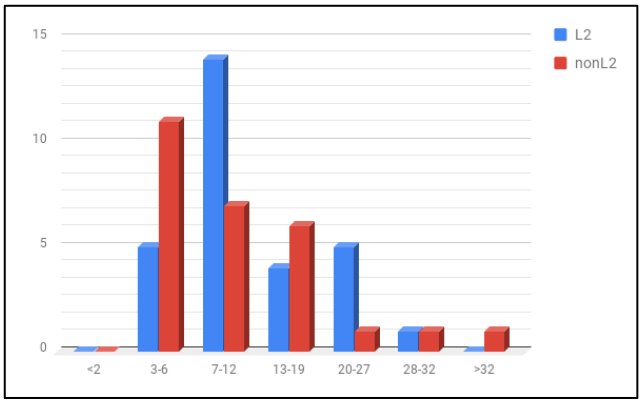


Figure 76: L2/ non-L2 – years of teaching practice (finer categories)

Merging the neighbouring categories, the cohorts are comparable, see Figure 77 below.

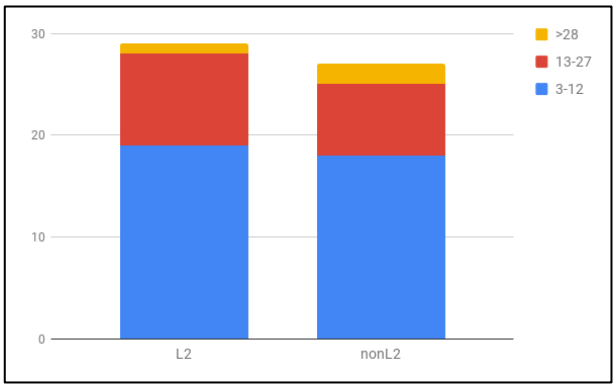


Figure 77: L2/ non-L2 – years of teaching practice

Speaking of gender, there is higher proportion of men among the non-L2 teachers. see Figure 78.

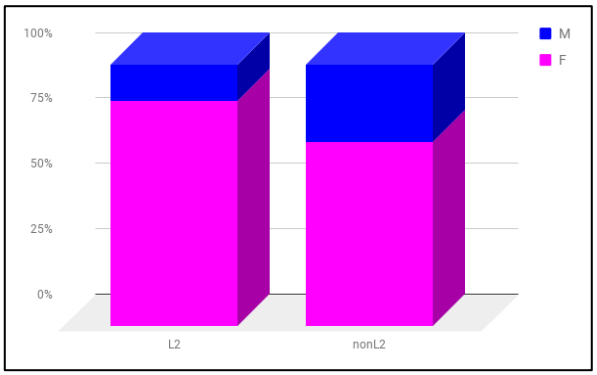


Figure 78: L2/ non-L2 – Gender

We want to point out that within each cohort, there are teachers with Mathematics teaching qualification and without it. While their proportion is higher among the teachers who do not have L2 teaching qualification, there is a significant ratio of L2 teachers who in addition have a Mathematics teacher training. On the contrary, among the non-L2 teachers, there are several who do not have formal L2 nor Mathematics teacher training, see Figure 79.

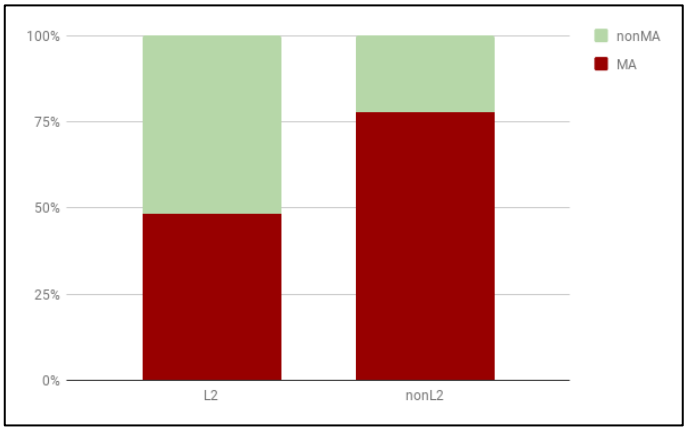


Figure 79: L2/ non-L2 –Mathematics teaching qualification

6.5.2 Questionnaire data comparison

Figure 80 presents an overview of questionnaire responses; it adds the average value for the number of L2 teachers' responses and their non-L2 counterparts.

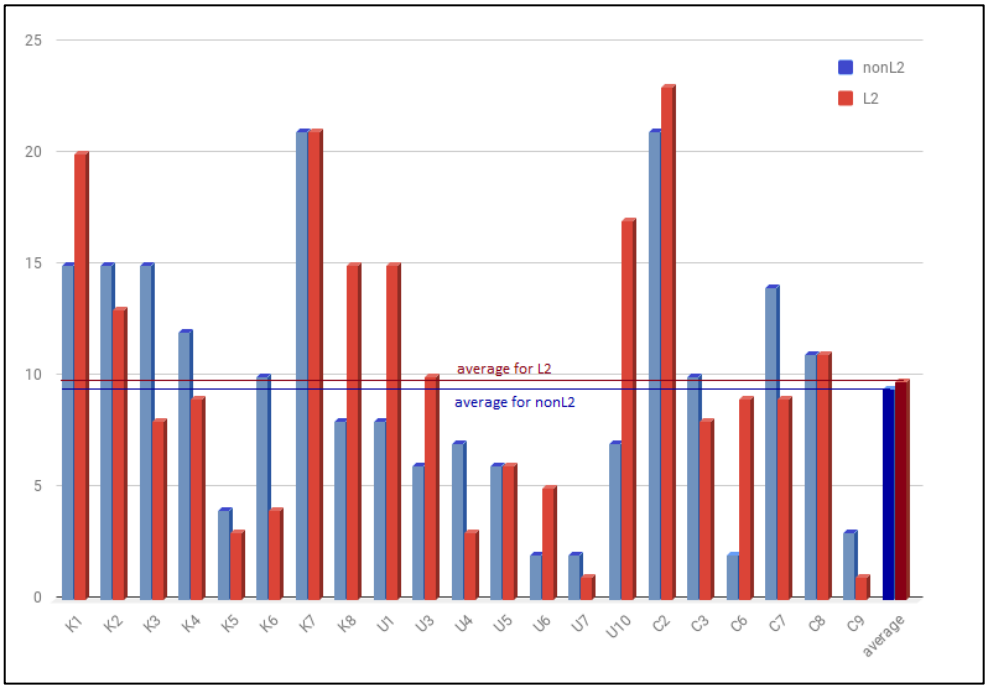


Figure 80: L2/ non-L2 questionnaire – LPAT categories overview

Looking at the top 8 features of each of the groups, we can see that both cohorts agree on five out of eight features, namely C2: worksheet, K7: attention to L2, K1: interaction, K2: objectives and C8: instructions for the teachers.

We investigated the questionnaire responses to establish whether there was a correlation between the L2 teachers' answers, and the non-L2 teachers'. We ran a Student-t test using the following pair of hypotheses:

H_0: There is no statistically significant difference between the number of Key features identified by L2 teachers and non-L2 teachers in the questionnaire.

H_A: There is a statistically significant difference between the number of Key features identified by L2 teachers and non-L2 teachers in the questionnaire.

Using the Student t-test, we found the t-value is 1.96246, the p-value is .027435. The result is significant at $p < 0.05$, meaning we cannot refute the H_0 – there is no statistically

significant difference between the number of Key features identified by L2 teachers and non-L2 teachers in the questionnaire.

Figure 81 features the data on differences in questionnaire scores across LPAT categories; based on the data from our questionnaire, we identify the following three categories:

A. more frequently identified by L2 teachers: U10 – tasks worked out; K8 – multimodality; U1 – structure; C6 – presentation;
B. no or low differences in L2 or non-L2 teachers: K1 – interaction; U3 – final review; U6 – culture; C2 – worksheet; K7 – attention to L2; U5 – reflection and adaptation; C8 – instructions for the teachers; K5 – higher order thinking skills; U7 – special needs students; K2 – objectives; C3 – timeline; C9 – FEP; K4 – output scaffolding, U4 – assessment.
C. Items more frequently identified by non-L2 teachers: K3 – input scaffolding; K6 – prior knowledge activated; C7 – prerequisites.

Focusing on the Key features of the CLIL lesson plan, we considered how many "points" could the key categories get from the respondents in each cohort, and we calculated the percentage of the possible maximum "Key features" score, see **Chyba! Nenalezen zdroj odkazů.**. We conclude that the non-L2 teachers identified slightly more Key features than the language teachers.

Table 11: Key features scores

		non-L2	L2 teachers
	Total points available (eight for each respondent)	27*8=216	29*8=232
Key features Score in the questionnaire for the individual key features: number of responses = number of "points"	K1	15	20
	K2	15	13
	K3	15	8
	K4	12	9
	K5	4	3
	K6	10	4
	K7	21	21
	K8	8	15
	Total "points" distributed	100	93
	%	46.30%	40.09%

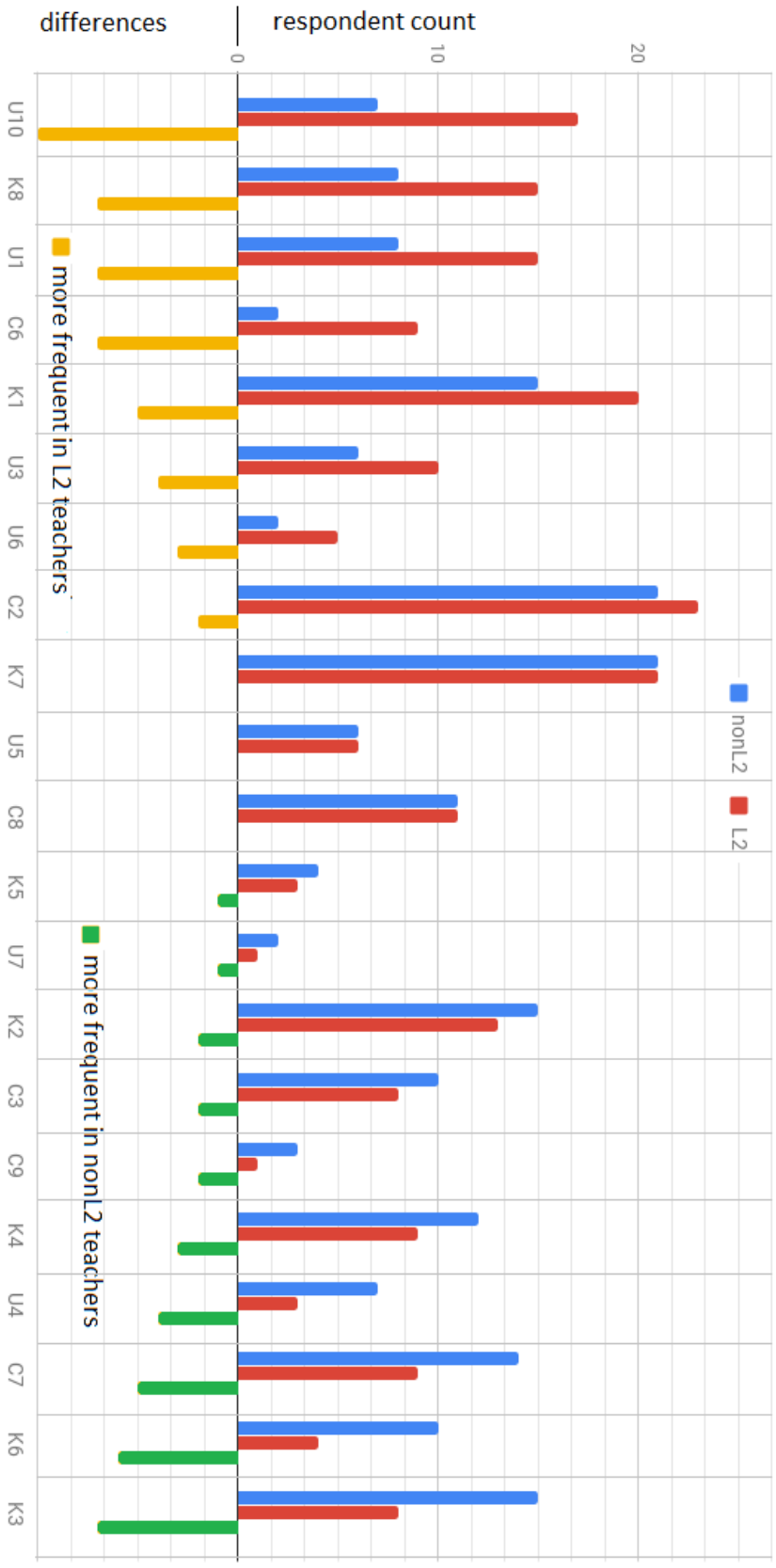

differences
respondent count
0
10
20
U10
K8
U1
C6
K1
U3
U6
C2
K7
U5
C8
K5
U7
K2
C3
C9
K4
U4
C7
K6
K3
more frequent in L2 teachers
more frequent in nonL2 teachers
nonL2
L2

Figure 81: L2/ non-L2 questionnaire – Differences across LPAT categories

L2 teachers were more likely to include the need for the tasks to be worked out, and interaction and multimodality among the top eight features of a CLIL lesson plan, and non-L2 teachers focused on input scaffolding and activation of prior knowledge more often than the L2 teachers. We offer a speculation in this respect: it may be that the L2 teachers considered CLIL from the language-learning side of the CLIL continuum and saw input scaffolding as a "given" feature of a lesson, in the sense that it does not need to be particularized as it is universally present, while for teachers not trained in L2 didactics, input scaffolding is a concept that comes as new with CLIL. Also, it would be interesting to establish what "prior knowledge" do the respondents deem worth of activating – whether they were aiming at L2 or at a non-linguistic content or possibly both. Second, it is possible that the financial mathematics/financial literacy context triggered the need for having solutions or tasks worked-out in L2 teachers – we mentioned on the fact that CLIL can be imposed on teachers, and our research imposed the content of the CLIL experiment on the respondents – it is possible that the L2 teachers felt more insecure about this particular context, resulting in their choice. As our survey did not inquire about the specifics of CLIL implementation nor about the attitudes of the respondents towards the content, no conclusions can be drafted.

6.5.3 Lesson plans data comparison

Figure 82 presents an overview across all LPAT items: it shows the differences in the LPAT items in the ratio of L2-teachers' lesson plans and the non-L2 teachers' lesson plans. With three exceptions, namely in K8, U5, and C6, there were no substantial differences. Seven categories were more evidenced in non-L2 lesson plans, ten categories were more often represented in L2 lesson plans, and in two cases there was the same evidence of them in both L2 and non-L2 lesson plans.

We investigated the data to establish whether there was a correlation between the number of Key features identified in L2 teachers' lesson plans, and in the non-L2 teachers' lesson plans. We ran a Student-t test using the following pair of hypotheses:

H_0: There is no statistically significant difference between the number of Key features featured in lesson plans by L2 teachers and by non-L2 teachers.

H_A: There is a statistically significant difference between the number of Key features featured in lesson plans by L2 teachers and by non-L2 teachers.

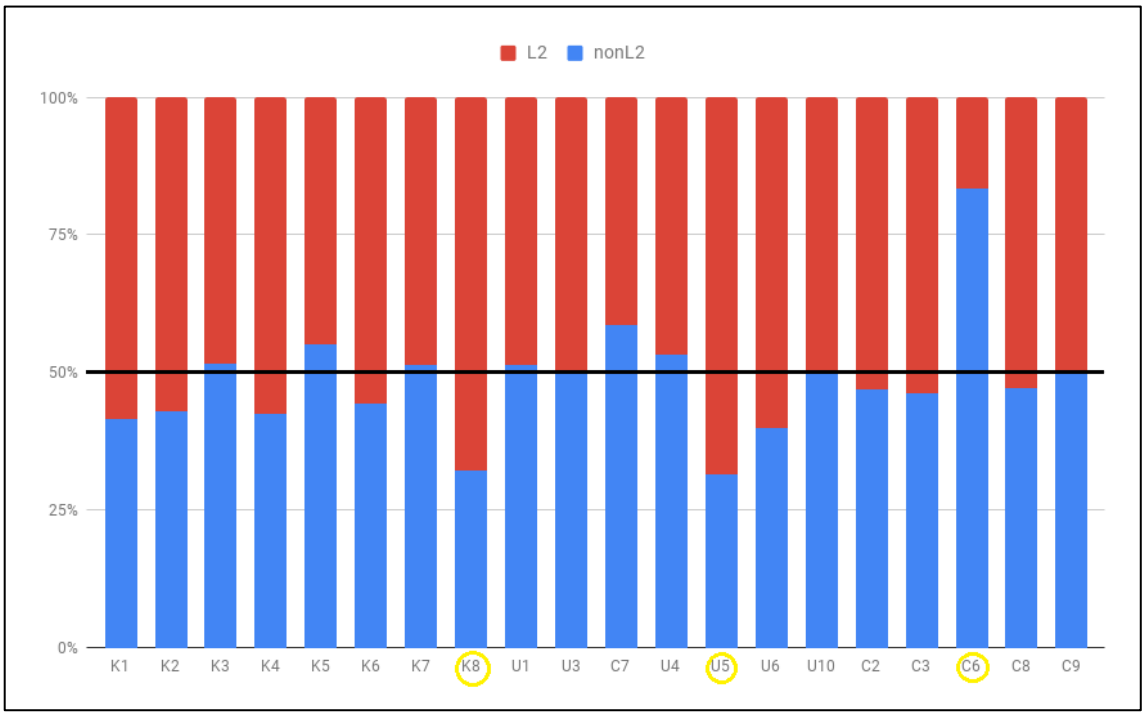


Figure 82: L2/ non-L2 ratio in lesson plans – Categories

Using the Student t-test, we found the t-value is -1.90712. The p-value is .030915. The result is significant at $p < 0.05$, meaning we cannot refute the H_0 – there is no statistically significant difference between the number of Key features in the lesson plans by L2 teachers and by non-L2 teachers.

We analysed also the differences within the categories, that is, in the manifestations of the categories. In this section, we illustrate the differences between lesson plans created by L2 teachers and non-L2 teachers, focusing on the details. We skip the categories that had only one aspect to record, since those are clearly evidenced in Figure 82: L2/ non-L2 ratio in lesson plans – Categories on page 149.

The individual categories are presented in charts that follow the same pattern throughout this section: L2 lesson plans are color-coded red, non-L2 lesson plans blue. They illustrate the ratio of L2/ non-L2 lesson plans featuring a specific manifestation of a given category.

To start with, we can see that Interests were selected as a topic mainly by non-L2 teachers, with L2 teachers typically selecting shopping or currency (see Figure 83).

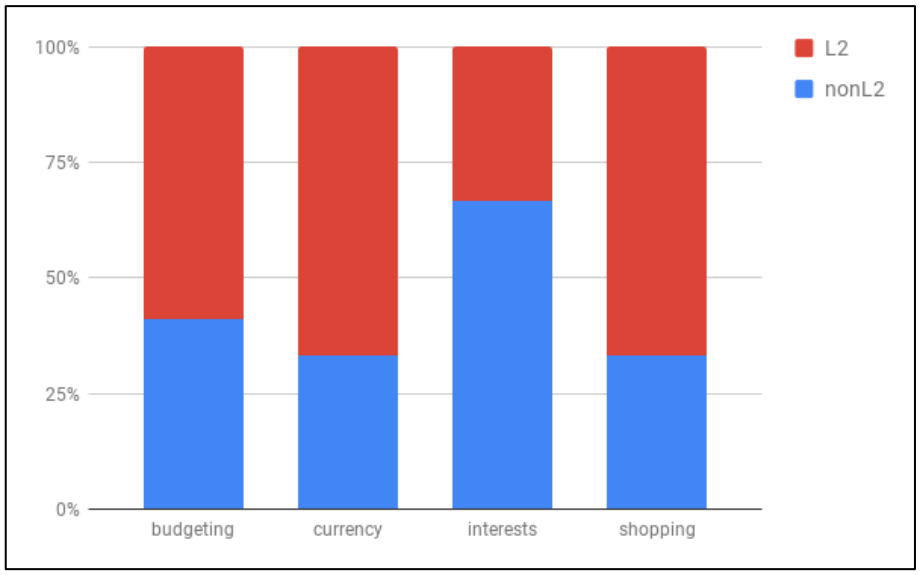


Figure 83: L2/ non-L2 lesson plans – Topics

We can see that both group work and pair work were employed in the two cohorts (see Figure 84: L2/ non-L2 lesson plans – K1 Interaction). However, non-L2 teachers preferred pair work to group work, in contrast with the L2 teachers.

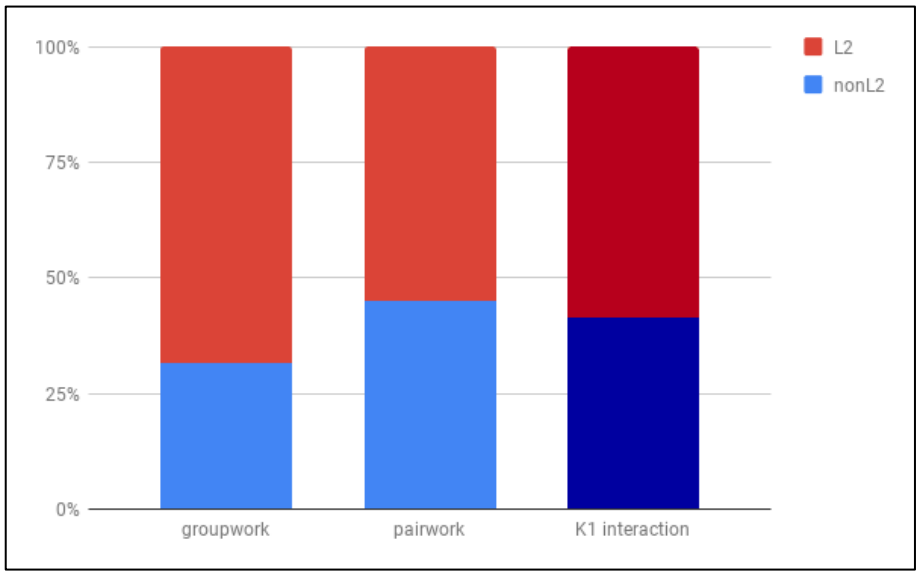


Figure 84: L2/ non-L2 lesson plans – K1 Interaction

Even though it might be tempting to hypothesise about L2 teachers and L2 objectives, the data suggest the opposite: in both cohorts, the ratio of teachers who included L2 objectives to those who noted down content objectives was almost identical (see Figure 85).

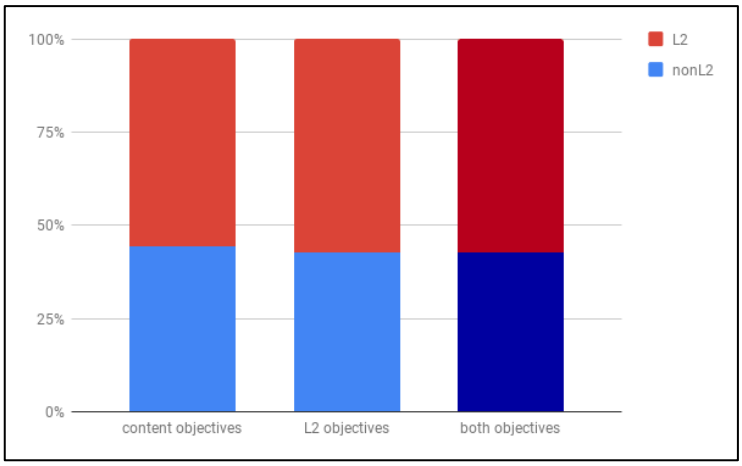


Figure 85: L2/ non-L2 lesson plans – K2: Objectives

Baecher, Farnsworth & Ediger (2014) observed that language teachers planning language objectives in content-based ESL instruction "tended to have more difficulty in designing language objectives than content objectives. There was also a tendency to write language objectives that focused heavily on the four language skills and on vocabulary, and considerably less often on grammatical structures, functions, or language learning strategies." In our sample, the language teachers designed virtually the same amount of language objectives as of content objective. We noticed the focus on vocabulary and grammar and less on language skills, functions or strategies in most of the L2 objectives in our sample – both in L2 teachers' lesson plans and the non-L2 ones.

The data suggest that there might be differences in types of input scaffolding employed by L2 teachers and non-L2 teachers. Multimedia were employed predominantly by L2 teachers, while non-L2 teachers recurred to other forms of input scaffolding more often than their L2 colleagues, see Figure 86.

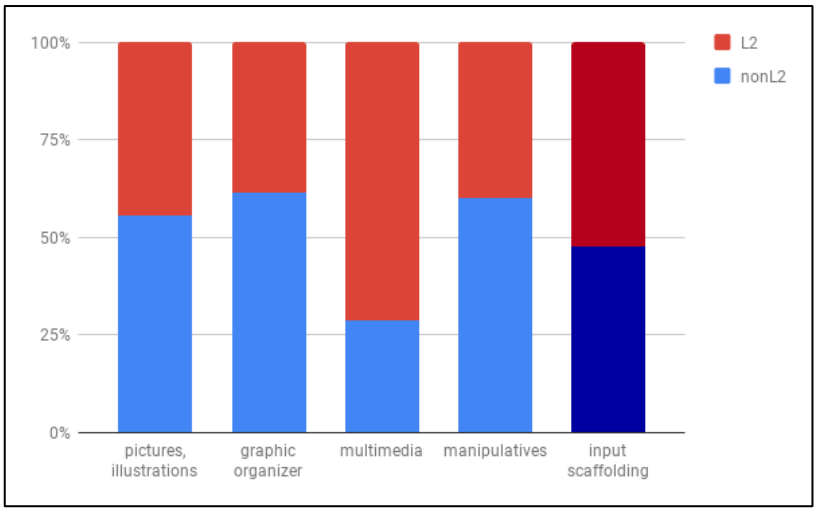


Figure 86: L2/ non-L2 lesson plans – K3: Input scaffolding

There are differences in output scaffolding, too. Non-verbal answers were employed almost exclusively by non-L2 teachers, while L2 teachers used sentence frames and sentence starters most often, see Figure 87.

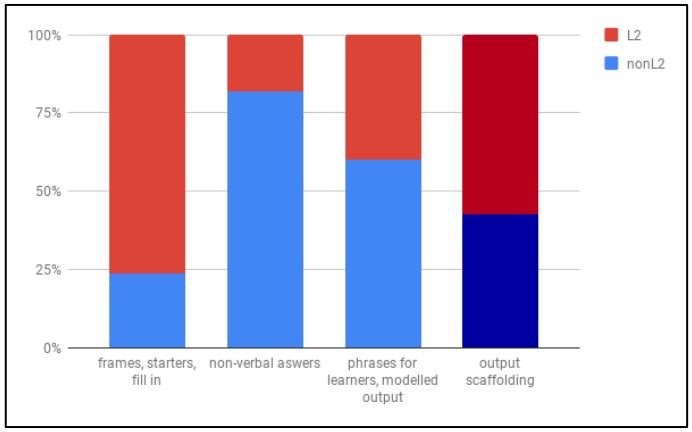


Figure 87: L2/ non-L2 lesson plans – K4: Output scaffolding

We found notable differences in the forms of focusing on L2, see Figure 88. In the overall category, only minute differences were observable in terms of the two cohorts. Taking into consideration the different manifestations, we found that L2 texts translated to L1 were present only in non-L2 teachers' lesson plans, the L2 and non-L2 cohort employed a glossary or a vocabulary list to a similar extent but the L2 teachers more often included an L2-oriented task.

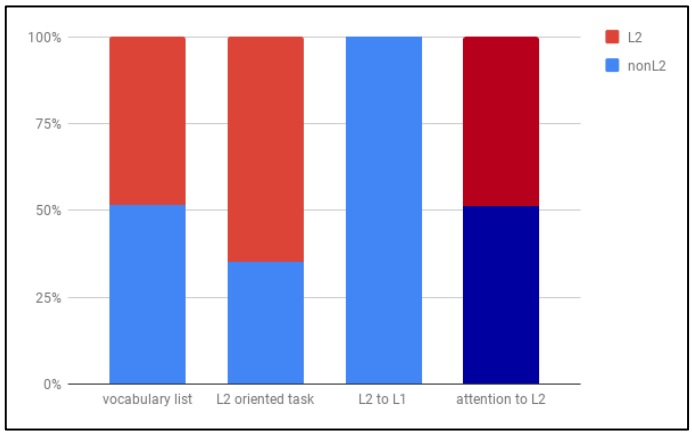


Figure 88: L2/ non-L2 lesson plans – K5: Attention to L2

We recorded the phrases for teachers as a manifestation of instructions for teacher. They were more often included in the L2 teachers' plans, even if the overall ratio of lesson plans featuring instructions for teachers was balanced for the two cohorts – see Figure 89.

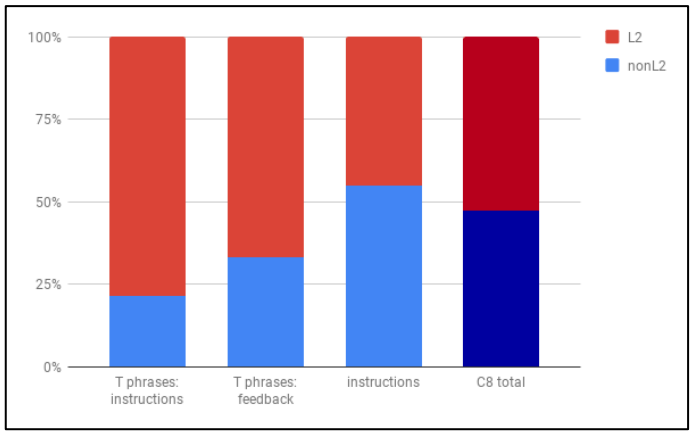


Figure 89: L2/ non-L2 lesson plans – C8: Instructions for the teacher

The non-L2 teachers' lesson plans featured some prerequisites more often than the L2 teacher's plans (see Figure 90); however, in each cohort only two lesson plans wrote down both language and content prerequisites.

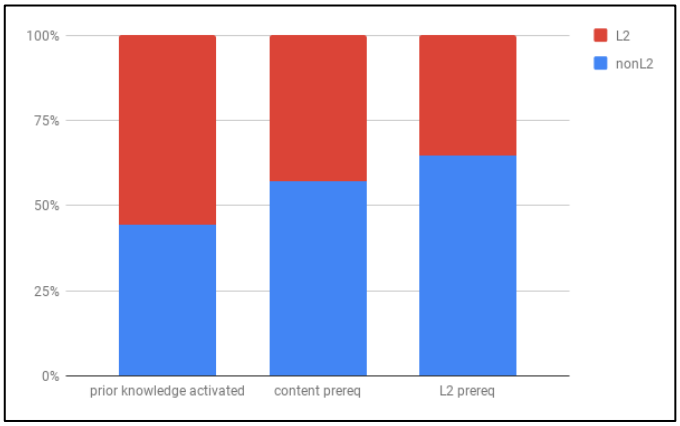


Figure 90: L2/ non-L2 lesson plans – C7: Prerequisites

Finally, Figure 91 presents an overview of the evaluative categories with respect to the two cohorts. Despite the cohorts differing in self-assessed L2 level (cf. Figure 74 on page 143), the evaluation of language does not show major differences. L2 lesson plans, however, fail in using the correct decimal separator more often than the non-L2 ones. We can see a clear trend in choosing an inappropriate content level: L2 teachers' lesson plans tended to go for a level too low for the given learners, while the non-L2 lesson plans often selected a level beyond the given level of education. Naturally, as we mentioned before, these choices might have differing motivations, and no implications are being made based on them.

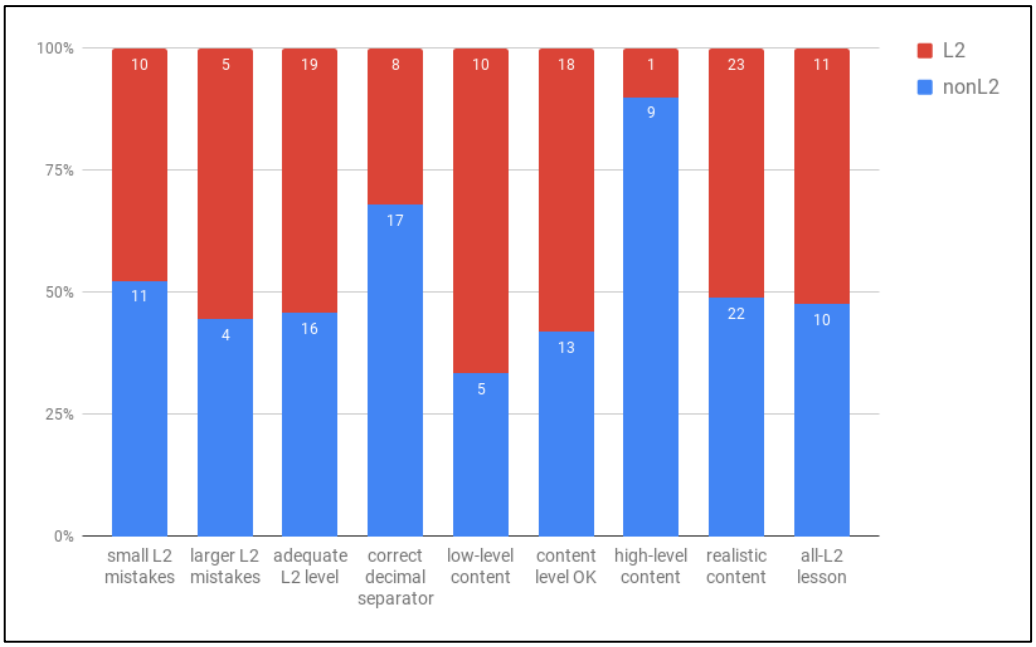


Figure 91: L2/ non-L2 lesson plans – Evaluative categories

Figure 92 details the amount of language mistakes in the lesson plans. We can see that there was no difference between the two groups in terms of language correctness.

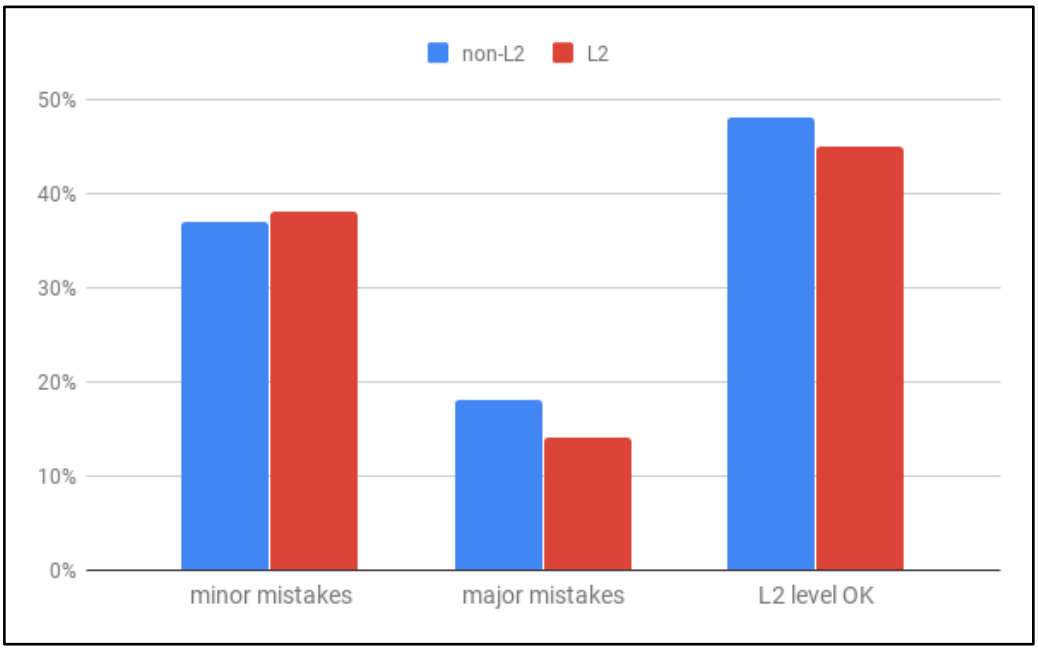


Figure 92: L2/non-L2 lesson plans: Language accuracy

6.5.4 Research question 4

Are there any differences (in terms of research questions 1 & 2) between the teachers of L2 and teachers without a L2 teaching qualification?

Our final research question aimed at the comparison between teachers with and without language teaching qualification.

The questionnaire data did not show a statistically significant difference between the two groups. Still, there were some interesting trends:

- non-L2 teachers more often identified both types of scaffolding as a feature of a CLIL lesson plan,
- L2 teachers more often answered that in a CLIL lesson plan, one of the key aspects is for the tasks to be worked out. Our speculation is that this superiority in numbers is influenced by the context of financial mathematics/literacy which might lead the language teachers to feel the need of having the "correct answers" ready.

The differences in lesson plans across the LPAT categories only rendered minor differences between the L2 and non-L2 cohort. However, notable differences were observed within the categories in terms of topic, scaffolding (especially – but not exclusively – output scaffolding), instructions for teachers, amount of L2 text translated to L1 and explicit formulation of prerequisites. Surprisingly, in our sample there was no difference between the cohort in writing L2 or content objectives.

DeGraaf et al. (2007, p. 620) in their study on CLIL lesson plans and their implementation in classroom observe that "the subject teachers in the study perform at least incidentally as effective language teachers". This observation corresponds to our finding of only minor differences in L2 and non-L2 teachers in a CLIL lesson planning context.

6.5.5 Tentative comparison based on CLIL practice

Analysing the data, we hypothesised whether there were differences between teachers who have had CLIL teaching practice and those who have not.

We ran a Pearson correlation test on the two data sets (first, data from the questionnaire, and second, from the lesson plans analysis). The correlation coefficient was $r = 0.26$ for the survey and $r = -0.02$ for the lesson plans. This suggests that there might be differences in the lesson plans based on CLIL experience. However, as we had not inquired about the extent of CLIL teaching practice, further investigation of this aspect would be necessarily hampered by this lack of input information. We do propose the investigation aiming at differing extent of CLIL practice to be carried out using our methodology, to provide insight in the impact of CLIL practice on CLIL lesson planning.

7 Conclusions

Fifty-six lesson plans prepared for a CLIL lesson of financial mathematics, created by Czech teachers with CLIL training, were analysed. We investigated whether these lesson plans corresponded to the requirements for CLIL materials. To do so, we ran a content analysis of the authentic plans. We further investigated whether these plans corresponded to their authors' perception of a CLIL lesson plan: we did this by comparing the lesson plans against data from a survey on teachers' concept of a CLIL lesson plan.

An original tool was designed to meet the needs of our research. Based on Tomlinson's concept of universal and local criteria for the evaluation of teaching materials, we combined a qualitative analysis of published literature with a survey among CLIL students and practitioners to create the LPAT – Lesson Plan Analysis Tool. In the core of the LPAT, there are eight key universal features of a lesson plan: these present a CLIL lesson plan model, against which our findings were weighed.

The thesis describes in detail the creation and piloting of the original observation tool and can thus serve as a basis for the design of further analytical materials in situations where the official guidelines based on a theoretical framework might not be reflected in what is perceived as good practice in a specific context. We propose that the LPAT can be used to investigate other CLIL materials in Czech educational system; furthermore, the design of the LPAT tool may be used for adapting the tool to the investigation of other didactic materials.

All the four questions posited in the beginning of the research were answered. Our research proved that the CLIL lesson plans reflect the Key Universal criteria only partially, failing to include key aspects of effective CLIL approach. Nevertheless, the lesson plans are consistent to a high level with the authors' own concept of CLIL. Comparing the L2 teachers and teachers without an official L2 teaching qualification, there are few significant differences in the general features that the teachers include in their lesson plans; however, the two groups often differ in the specific manifestations of these features.

The teachers in our study showed, both in the survey and the lesson plans, that a worksheet is an inherent part of a CLIL lesson plan for them. This might suggest that they are planning their lessons around a specific material or task rather than based on learning

objectives; besides, formulation of the dual objectives of the lesson was one of the most often missing key CLIL features in the lesson plans, which contributes to our conjecture.

We provided plentiful evidence on the importance of scaffolding in CLIL, and specifically, in Mathematics. The teachers in our sample demonstrated the use of a variety of scaffolding techniques for both the input and the output, and different approaches to dealing with the linguistic aspects of the lesson. Interestingly enough, the L2 teachers employed significantly different strategies than their non-L2 counterparts. Based on this finding, we suggest that it would be beneficial for each CLIL training to include both L2 teachers and content teachers, since the different approaches can be mutually enriching and lead to a more effective CLIL practice.

The evaluative part of our lesson plan analysis showed a strikingly high ratio of language errors in the lesson plans, and of inconsistent use of decimal separators. We propose that the issue of language adequacy be discussed in CLIL training, and the use of proof-readers be strongly encouraged by the trainers.

To provide deeper insight into the issue of CLIL lesson planning, we propose:

- Interviews with the respondents to expand on the questionnaire data and provide a more complex view of their theoretical concept of a CLIL lesson plan,
- Using the LPAT on a different set of CLIL lesson plans, to confirm the consistency of our findings,
- Using the LPAT to analyse the respondents' lesson plans intended for teaching in L1 and/or an ESL lesson, to show which of the observed tendencies are CLIL-specific and which are connected to the respondents' teaching style,
- Collecting data on the extent and nature of CLIL teaching practice among the respondents, to confirm or disprove the hypothesis that the contents of a lesson plan correlate with the amount or type of the author's CLIL teaching practice.

Unlike in other educational contexts where lesson plans are elaborated by expert teams, Czech teachers are used to creating their own lesson plans. CLIL lesson plans, however, present a challenge for most, due to the dual objectives of the lessons, the universal lack of adequate materials and thus the need of adaptation thereof, and specific requirements of effective CLIL approach. Nevertheless, CLIL teachers might benefit from sharing the strategies they employ between language teachers and content-subject teachers.

List of abbreviations

BICS	Basic Interpersonal Communication Skill (Cummins)
CALP	Cognitive Academic Language Proficiency (Cummins)
CLIL	Content and Language Integrated Learning
EFL, ESL	English as a Foreign/Second Language (used interchangeably)
FEP	Framework Education Program
HOTS	Higher order thinking skills (Bloom)
ICT	Information and communications Technology
ISCED	International Standard Classification of Education
L1	mother tongue, official/dominant language of instruction/communication
L2	foreign/second language, additional language to L1; in CLIL provisions, the vehicular language of instruction in CLIL provisions
L2 teacher	teacher qualified for teaching L2
LOTS	Lower order thinking skills (Bloom)
LPAT	Lesson Plan Analysis Tool
MA	mathematics
NIDV	Národní institut dalšího vzdělávání, National Institute for Further Education
Non-L2	not being qualified as a teacher of L2
OECD	The Organisation for Economic Co-operation and Development
SEP	School education Program
SIOP	sheltered instruction observation protocol (Echevarria et al.)
ZPD	zone of proximal development (Vygotsky)

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